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CASE OF RECTO-VESICULAR FISTULA IN A HORSE.—RECOVERY.

BY J. A. NUNN, D.S.O., F.R.C.V.S., ARMY VETERINARY DEPARTMENT, PRINCIPAL, LAHORE VETERINARY SCHOOL.

THE patient, an aged, white entire cob, the property of a native cab-owner, was brought to the out-patient department of the Lahore Veterinary College, at about 8 a.m., on the 14th of January, the owner stating that the animal had been passing the whole of his urine through the rectum, and had been doing so for some days past. The horse was in a miserable condition and much distressed. The temperature was 102°, pulse 54, respirations slightly quickened; the mucous membranes somewhat injected, and of a dirty yellow colour. The thigh and perinæum were somewhat excoriated, and there was a constant dribbling of urine, mixed with fæces, from the anus. On examination the penis was found to be much inflamed and enormously swollen, with a large sloughing ulcer on the dorsal surface of the glans, and a large quantity of pus, probably about a pint, imprisoned between it and the walls of the prepuce. The mouth of the urethra was tightly constricted, scarcely admitting a silver probe, for about two inches from the orifice. This constriction was divided on a director, and the catheter passed; when a second stricture was discovered, also about two inches in length, commencing about three inches below the ischial arch. This constriction offered considerable resistance, but by steady and continued pressure the obstruction was overcome, and the catheter passed into the bladder, two or three ounces of urine being drawn off. As the owner refused to allow the horse to remain in the hospital, the penis and prepuce were well washed and dressed with carbolic acid and oil. The

ordinary hospital febrifuge draught were given, and the owner directed to foment the sheath and penis, and to bring the horse twice daily for the part to be dressed, and the catheter to be passed. Bran diet was ordered. The temperature on the 17th had run up to 103°. Extract of belladonna and opium were given twice daily in a bolus, and suppositories of the same drug used till the 20th, when the temperature was normal. The urine continued to be passed by the rectum till the 25th, when the whole came *via* the urethra, after which the catheter was not again used, the flow of urine being normal. With the exception of the remains of the ulcer on the penis, the animal is now convalescent, and has very much improved in condition. Undoubtedly, the fistula was due in the first instance to the stricture of the urethra, causing retention of urine, which accumulated and ruptured the bladder at its upper surface, that viscus opening into the rectum, the stricture in all probability being the result of irritation caused by the sore on the penis.

PROLONGED UTERO-GESTATION IN A HEIFER.

BY WM. HODGSON, M.R.C.V.S., BRIGHAM, CUMBERLAND.

On the night of the nineteenth of February, I received a message from Lamplugh Hall to attend a heifer, the property of Mr. W. Batey, said to be showing portion of the placental membranes.

On my arrival I found a big white heifer, exhibiting, as stated, a portion of placenta and straining considerably, but not in the least prepared for calving. Before examination, I learned the following history:—Twelve months previous to date, the heifer, then two years old, was served. After the lapse of the usual period of gestation, she in some measure prepared for parturition, which act, however, did not take place; the swelling of vulva and the udder formed, both disappearing in a short time. The heifer keeping in perfect health, the owner was satisfied that there was no calf. Three months after this she came in season, and, being a valuable animal, she was again served; a few hours after service, on the cowman entering the byre, he found her straining, and in a short time the portion of placenta appeared.

Considering the case to be very unusual, I introduced, with difficulty, my hand per vagina, when I felt a fully-developed calf, presented head first, fore limbs back, the uterus being tightly contracted on to the fœtus, consequently leaving no room for manipulation. My only practicable course was to draw out the head, which

was done by means of hooks inserted in the orbits, and a cord placed round the neck, considerable force being required, owing to the narrowness of the passage; after decapitation, I got up the fore limbs and removed them; the remainder was taken away piecemeal. The serious hæmorrhage which occurred immediately afterwards, I controlled by means of cold water cloths introduced well into the vagina. The heifer in a short time made a good recovery.

I might add that the fœtus was very little decomposed, the only perceptible change being a shrivelled condition of the flesh; the skin was quite tough.

DEATH FROM SWALLOWING A SMALL PIECE OF TIN.

BY H. T. PEASE, M.R.C.V.S., A.V.D., VETERINARY SCHOOL, LAHORE, INDIA.

A PUNJABI cow suffering from Foot-and-mouth Disease, and which had been under treatment at the Amritsar Veterinary Hospital, was reported fit to discharge on the evening of the 20th of February, 1891. She was examined and found to be apparently in a perfect state of health, and fit to be discharged. She ate her evening meal with a good appetite, and was left all right at night. On opening the hospital at 5 a.m. on the morning of the 21st, she was reported to be dead. She was found to be much distended with gas in the abdomen, which was tense and tympanitic. A quantity of food had been vomited, and some blood had escaped from the anus. The visible mucous membranes were very pale. A *post-mortem* examination was made by Veterinary-assistant Ghulam Ashraf. The abdominal cavity was found to contain a very great quantity of blood, which bathed and had stained all the viscera. The liver was pale, and presented a cut more than two inches in length, and evidently made with some sharp instrument. A similar cut about an inch in length was found in the portal vein, and the diaphragm had also been cut through and the lung wounded, so that the thorax contained much blood. On searching for the cause of these wounds, a piece of tin was found impacted in the cardiac orifice of the œsophagus, exactly the size and shape of the drawing.* This tin was exceedingly sharp both at edge and point, and had lacerated the œsophagus considerably, also causing the wounds in the liver, portal vein, diaphragm, and lung, leading to death from internal hæmorrhage.

* This represents an angular piece of tin, about 1½ inch long in one direction and three-fourths inch in another, both extremities being pointed.

NOTES ON NEW DRUGS.

BY J. DOWLING ALLMAN, A.P.S.(LOND.).

"Bismuth Subiode."

This substance is prepared according to Mr. C. Mayo (*American Journal of Pharmacy*, December, 1886, p. 590), by triturating 306 parts of bismuth subnitrate and 156·6 parts of potassium iodide with sufficient hydrochloric acid to form a paste, which becomes yellow, and is then thrown into water, where the reaction is completed, a heavy, amorphous, adhesive, brick-red powder being precipitated. The product is represented by the formula BiOI or $BiOI,H_2O$, and is insoluble in water, alcohol, ether, and chloroform; it is decomposed by strong mineral acids and alkalies.

Therapy.—Bismuth subiode has been successfully employed by Mr. T. Bowhill, M.R.C.V.S., of Darlington, for dusting over ill-conditioned wounds, and, relying on his careful clinical notes, I can confidently recommend the substance as a topical application to wounds and indolent ulcers. It acts something like iodoform, but has the advantage of not possessing so powerful an odour as that drug. It is well suited for sprinkling over diseased surfaces, as it is a powerful antiseptic, and serves to alleviate pain, and hastens cicatrization. Mr. Bowhill generally uses the drug for dusting over wounds with a bottle fitted with an indiarubber tube and ball, which acts very like an "Insufflator." It is an American invention, and if it could be obtained in this country, it would be very useful to the veterinary surgeon.

Cocaine.

An ointment containing erythroxylon, or hydrochlorate of cocaine, is recommended by Dr. Shoemaker (*Medical Bulletin*, February, 1891), as an admirable local remedy in skin affections characterised by severe pain or distressing itching.

℞ Extracti Erythroxyli Cocæ	℥ss.
Creosoti	m.v.
Ungt. Zinci Oxidi	℥i.
" Plumbi Subacetatis	℥ss.

Misce.

This would be an excellent ointment for the severe forms of Eczema supervening an attack of Mange in dogs, as it would allay pain and the horrible itching. It is well worth a trial.

Ergot.

The following will be found a valuable recipe for Diarrhœa and Dysentery in cattle:—

℞ Extracti Ergotae fl...	f. ℥iss.
" Hamameldis fl.	f. ℥iss.
Elix. Guranæ fl.	f. ℥ii.

Misce.

Half to be given, and the remainder in two hours if the relaxation does not cease. The mixture can be also employed in the several forms of capillary hæmorrhage, and in overcoming the congestion attendant upon and causing the oozing.

FRACTURE OF THE SACRUM.

BY WALTER S. ADAMS, VETERINARY SURGEON, 1ST CLASS, A.V.D., REMOUNT DEPOT, HOSUR, INDIA.

This case, on account of the exceptional nature of the fracture, is, I think, worthy of record. A mare, which was known to be restive in her stable, was found to be partially paralysed in the hind quarters, and was supposed to have sustained an injury in the stall, although there was no history with the case, and there were no marks of any struggle in the place. She was able to stand and walked to the sick lines. I examined her, but could not detect the exact nature of the injury. The mare stood all night leaning against the wall for support. She fell on the following morning, quite paralysed in the hind extremities, and died in a few hours. On post-mortem examination, a great extravasation of blood was seen beneath the lumbar vertebræ and the sacrum. On removing this, a fracture was discovered at the base of the sacrum, which extended into the spinal canal. The wing of the sacrum on the left side was also broken off. Superiorly, there was no external mark of injury, and there was no fracture of the spinous process. There was no displacement of the vertebræ, and until the paralysis of the hind extremities became complete, the mare was able to stand, and even walk, as there was no injury to the true weight-bearing structures. This remarkable fracture could only have been occasioned by extreme violence, and it is extraordinary that there should have been absolutely no history with the case. The case was hopeless from the first, and all that could be done was to give the animal as easy a death as possible.

ANIMAL HEAT IN HEALTH AND DISEASE.*

BY S. SISSON, V.S., VETERINARY COLLEGE, TORONTO, CANADA.

It will be readily admitted that a thorough understanding of the phenomena of heat production and heat loss in the animal economy is of the utmost importance to the veterinarian.

The constant use of the clinical thermometer renders this

* Read at a meeting of the Ontario Veterinary College, Toronto, on February 24th.

absolutely necessary; as its readings, to be of practical benefit, must be mixed, like the great painter's colours, " with brains."

The subject, of course (especially in its pathological aspect), is too complex to admit of exhaustive treatment within the scope of this brief essay, which will consist of a cursory resumé of its more salient features only.

Indeed, some factors in the problem of animal thermogenesis are not yet, by any means, definitely understood: the animal body being the seat of processes as yet quite unknown to the laboratory of the chemist. Fortunately, however, these are of secondary importance, and do not very materially invalidate conclusions reached without a consideration of disputed points. Body temperature may be defined as the balance between Thermogenesis and Thermolysis.

In the homoiothermic animals (the mammalia and aves) the normal temperature varies only slightly. Hence the significance of of thermometry as indicating calcrifacient disturbance.

In cold-blooded animals, on the other hand, this exquisite balance is not maintained.

Hence they are termed " poikilothermic ": their temperature varying with that of their environment, or being only very slightly above it.

Animal thermogenesis is a chemico-vital process, depending on cell-activity for its various chemical changes.

Metabolism may be conveniently divided into constructive and destructive, and it is from the latter that heat is evolved.

All protoplasmic activity does not evolve heat—synthetic metabolism rather absorbs heat. This fact adds greatly to the difficulty of obtaining exact calorimetric data, as the amount of heat thus rendered latent cannot yet be estimated.

Also the rate of metabolism and consequent heat production varies greatly not only in different species, but also in individuals of the same species.

Consequently every species has a " specific coefficient," and every individual a " personal coefficient " of heat production.

For instance, it might be very naturally expected that of two animals differing in size, the larger would produce more heat proportionally than the smaller. But the heat-loss in the smaller animal is proportionately greater in consequence of its greater relative surface.

Hence it is found that, to enable the animal to survive in the " struggle for existence," the process of evolution has raised its personal coefficient. What then are, briefly, the sources of animal heat?

Here, a careful distinction must be made between energy and heat.

The body receives potential energy from the food by its oxidation into waste-products, as urea, carbon dioxide, and water. This potential energy is liberated as actual or kinetic energy and as heat.

Now the amount of energy resulting from the oxidation of one gramme of fat into CO_2 and H_2O is constant, no matter what intermediate changes, synthetic or analytic, it may participate in.

Similarly the oxidation of one gramme of proteid in the body liberates an amount of energy equal to that resulting from the *complete* oxidation of one gramme of proteid minus the amount lost by the incomplete oxidation of the resultant urea.

In this way has been determined the average income of energy which results in twenty-four hours from the ingestion of known amounts of food.

This has been accomplished by direct calorimetric observations. Foster tabulates the proportions as follows:—

1 gramme of proteid	=	5,000 calories
1 gramme of fat	=	9,000 „
1 gramme of C. hydrate	=	4,000 „

In the case of the proteid, we have to subtract 500 calories as representing the amount of energy lost by the excretion of $\frac{1}{3}$ gramme of urea—thus leaving 4,500 calories available to the body.

These observations were corroborated by the physiologist Ranke by experiments on himself with a diet, composed of 100 grammes proteid, 100 grammes fat, 240 grammes carbohydrate.

From this may be deduced:—

(1) That the proteids supply a relatively small part of the energy.

(2) That the large amount of carbohydrate supplied only slightly more energy than the much smaller proportion of fat.

Food material was divided by the older authorities into nitrogenous or histogenetic and non-nitrogenous or respiratory. Such a view would materially simplify the problem of metabolism, but, unfortunately, later investigations have proven this theory untenable.

It has been shown that exercise *of itself* does not increase the amount of urea excreted, although severe exertion immediately following ingestion of a large amount of proteid containing food may do so.

In the latter case it is highly probable that a considerable amount of the increase noted has its source in hepatic activity.

On the other hand, the excretion of carbon dioxide is always greatly increased by severe exertion, amounting in one hour to five-fold.

And actual examination of muscle has shown that its contraction is almost exclusively at the expense of its non-nitrogenous elements.

Proteids must, therefore, be regarded as fulfilling a double

function, and have been divided into tissue or morphotic proteids and circulating or floating proteids—the latter never becoming an integral part of the tissues, but being purely heat-producing. This was termed luxus-consumption of proteid, and partly explains the well-known fact that animals will not fatten on a diet rich in proteids, but not properly balanced. Indeed excess of proteid material, by increasing general metabolism, may even reduce the fat of the body.

Fats have two metabolic functions:—(1) Assisting proteid-digestion, and maintenance of the nitrogenous equilibrium, and (2) Production of heat. Prior to the latter, of course, they may be stored up as adipose tissue.

Water, salts, gelatine, etc., have only a very slight direct influence on heat-production, although very important indirectly.

The income of energy thus obtained is expended in two ways, as actual work and as heat. The former will include locomotion and other motion, displacement of atmosphere in respiration and speech, and the (very slight) movements of the vascular system against the air or contiguous bodies. Loss as heat occurs by conduction, radiation, and evaporation; by perspiration, respiration, urine, and fæces.

The amount of energy evolved by man in a good day's work has been estimated at about 150,000 kilogramme-metres.

The relative amount of energy liberated in each of these ways has not as yet been accurately estimated, but may be roughly stated to be $\frac{1}{5}$-$\frac{1}{6}$ by the former, thus leaving $\frac{4}{5}$-$\frac{5}{6}$ to appear as actual heat.

By far the greatest amount of heat given out by the body is traceable to catabolism of muscle, although exact data cannot be furnished. Next to this may be placed the various secreting glands, especially the liver. This is well shown by the fact that in the hepatic veins is found the warmest blood in the body.

In fever, however, glandular heat-production is lessened exactly in proportion as their functional activity is interfered with. A slight amount of heat is also generated in the brain, as its temperature is higher than its blood-supply.

The blood itself is not the seat of any important metabolism, consequently its heat-production is quite inconsiderable.

Still more insignificant is the heat produced in the indifferent structures, such as bone, cartilage, and connective-tissue.

The per cent. of heat-loss by the various thermolytic media has been estimated as follows:—

By the skin	... ...	77 per cent.
,, respiration	...	20 ,,
,, urine and fæces	...	3 ,,

In the skin variations are due chiefly to the amount of cutaneous circulation. Thus vaso-motor depression dilates the capillaries and increases thermolysis, and conversely vaso-motor stimulation decreases loss.

These variations are accompanied by a co-extensive reverse ratio of the internal circulation, constituting compensatory anæmia or hyperæmia, as the case may be. The hygroscopic condition of the atmosphere also has a considerable effect on evaporation.

Loss by perspiration is regulated by the special nerves of perspiration. Loss by respiration is varied by its frequency and depth, and also by the temperature of the atmosphere. There can be no reasonable doubt that Thermotaxis, or the delicate balance between Thermogenesis and Thermolysis, is referable to a centre or centres in the central nervous system: but, owing to conflicting views among investigators, definite statements as to their location and mode of action would be premature.

A diurnal variation is noticed in health of from $\frac{2}{5}°$ to $\frac{3}{5}°$, the maximum being from 9 a.m to 6 p.m., and the minimum from 11 p.m to 3 a.m.

Exercise, meals, and variations of external temperature cause only slight changes of body-heat. It will easily be seen that no very sharply-defined line can be drawn between physiological and pathological temperature. But we are materially assisted in our conclusions by the fact that variations in health are slight (not usually more than 1°), and explainable by collateral circumstances, while the range in disease is much more extensive, and persists with an upward tendency till other decisive symptoms appear.

During the incubative stage of disease, when the pulse shows no change, even to the experienced touch, the thermometer is in a sense prophetic, revealing with unerring fidelity the abnormal process of function otherwise totally unappreciable.

Taken in conjunction with the concomitant symptoms, thermometric observations are of the utmost value and significance, affording an accurate criterion as to the intensity of the morbid process and its probable termination; thus furnishing a basis for prognosis and indicating the therapeutic means best adapted to the case.

The various classes of diseases have typical ranges of temperature peculiar to them, and a knowledge of these is of the highest importance. A single illustration will serve to emphasise this fact.

In the cow we have three common *post-partum* diseases, namely, Paralysis or simple Adynamia, Parturient Fever proper, and Parturient Apoplexy. In the first we seldom have a higher reading than 101°. In the second (or Metro-Peritonitis) much

higher temperature is found, and the diurnal variation is notably interfered with. While in the apoplectic form the highest readings are very slightly above normal, and occur during nervous excitement, the approach of coma being marked by a declension which may be several degrees sub-normal. A reversal of the physiological diurnal variation is a very grave symptom, indicating, as it does, not only increased tissue destruction, but serious interference with the normal process of repair. Conversely, it is a hopeful sign when the temperature falls moderately between evening and morning.

Slight variations from the typical range peculiar to the case may originate in neglect on the part of an attendant, or the unwise allowance of food, either in too great quantity or unduly stimulating in quality. Here the *thermometer* never equivocates. Such changes, of course, are transient, and disappear with the removal of the cause and the relief of a consequent constipation or retention of urine.

Increase of temperature is the direct cause of the increased frequency of pulse and respiration, and in this diagnostic trinity the first is certainly not the least.

From the relation of the first two may be deduced the following conclusions :—

(1) That a rise in temperature is accompanied by a corresponding acceleration of pulse.

(2) That these are an exact index of the intensity of Pyrexia.

(3) That convalescence is ushered in by a fall of temperature and corresponding improvement in tone of the pulse.

(4) That a sudden fall of temperature accompanied by a rising pulse augurs a speedy dissolution.

Continued high temperature results in parenchymatous degeneration of tissue, chiefly affecting the muscles and secreting glands. The heart is thus soon weakened, and its cavities may even become dilated. This, together with degeneration and paralysis of the muscular fibres in the arterial tunics, results in the quick, weak pulse so characteristic of advanced stages of fever. The spleen is usually enlarged, frequently very soft, showing sometimes cone-shaped infarctions. The liver and kidneys are also generally enlarged, undergoing parenchymatous and fatty degeneration. Each fever, of course, has its own special lesions according to the structures involved.

In many cases, especially where death is sudden or occurs during an acute disease, *post-mortem* rise of temperature may be noticed This is explainable on the ground that somatic death does not necessarily imply immediate molecular death. Thus Thermogenesis persists, while Thermolysis is greatly decreased.

In closing the subject, it may not be superfluous to add that the clinical thermometer should be absolutely reliable, as any other would be worse than useless. Such an instrument, intelligently used, so far from being a mere scientific toy, will prove of inestimable value in the diagnosis and prognosis of disease to the practitioner of veterinary medicine.

GENERAL REMARKS ON SKIN DISEASES.

BY R. W. BURKE, F.R.C.V.S., CORRESPONDING MEMBER OF THE ITALIAN VETERINARY ACADEMY, VETERINARY DEPARTMENT, AMBALLA.

(*Continued from page* 93.)

Chronic Pruriginous Eczema of the Horse.

This disease is found in various stages. In its advanced stage it is known as *Madidans et pustulosum*, which is most frequently found on the hairy parts of the body. When occurring on the crest, it is commonly known as the "Mane" and "Neck-itch." On the tail, it is called the "Tail-itch." Less frequently it is seen on the head, when it is termed the "Head-itch," or "Lip-itch." The hairs are chiefly involved and are matted together, and soon fall off, leaving the condition known as "Rat's-tail."

Etiology.—The causes are of a local nature. Uncleanliness and improper grooming of parts covered by long hair are the chief causes, and which lead to a collection of dirt, lice, ticks, etc. The disease occurs chiefly in dirty inn and hotel stables, where attention to proper grooming is neglected, as in Poland, Russia, and Tartary. Conversely, the disease may follow as a result of extra rubbing and grooming, and frequent washing with soap which is afterwards imperfectly removed from the hair-roots. This leads to a continued irritation and pityriasis, dampness of the hairs, which creates a maceration of the epidermis and affects normal secretion of the skin (excessive perspiration). This, in the sheep, is the chief cause of all eczemas. Inflammatory changes induced by rubbing, etc., may also produce it (*Eczema squamosum*).

Symptoms.—Owing to the long hairs, the disease usually escapes detection in the early stages, it being seldom noticed until, through rubbing, the hair changes and depilation set in. The changes briefly are as follows: The skin surface, covered by hairs, appears puffy from serous, purulent, bloody, or a crustaceous covering, on which small vesicles and pustules may be detected. The hairs are glued together by a filthy, greasy substance, which is deposited in a thick layer (*Plica polonica*). In a more advanced stage, an inflammatory process in the hair-papillæ is established, which

affects the hairs. The hairs become, then, thinner, curly, and, owing to the thinness and irregularity, allow more freely of the passage of dirt and filth of every kind. In parts where the animal can rub or bite itself, it leads to atrophy and shedding of the hair. In the last case, it ultimately leads to sclerosis, with a depression of the hair-papillæ and permanent baldness ("rat's-tail"). Simultaneously the skin becomes tougher than normal skin, and assumes a form of chronic squamous Eczema.

Course.—The course is usually a protracted one, the disease being difficult, if not impossible of cure.

Treatment.—Next to cleanliness is dryness of the affected skin. In order to keep the parts perfectly dry, the hair should be previously clipped. After carefully washing and drying the affected parts, apply either tar ointment or some astringent powder, as iodoform, with pulverised oak-bark, or a 6 per cent. caustic lotion.

In the earliest times the above was described as an enzoötic disease, and internal remedies were prescribed. Spinola (*Specielle Pathologie*, 1863) and others consider the cause to be constitutional. Haubner attributes it to digestive derangements; and others again consider it is due to the Itch-scab. More recently, Haselbach (*Zeitschrift f. Mikroskopie u. Fleischbeschau.*, 1884, p. 230) has noticed it in 10 per cent. of the whole of the Polish horses, and regards it as a special disease of the hairs, possessing an adhesive discharge. Formerly, a true and false variety were described, which led to greater confusion. It is proved conclusively to owe its origin merely to penetration of dirt, grit, lice, etc., into the hair-roots. This disease, although long recognised in the human subject, has only lately attracted notice among the lower animals.

Eczema of the Extremities.

An Eczema appears on the skin of the coronet and pastern, attended by a more or less copious discharge, which has been called "Mauke" by the Germans, resembling Small-pox eruptions. The Eczema noticed on the skin at the bend of the knee and hocks, and known as "Raspe," is not nearly so frequent as the above-named disease, since it is much higher up than it, and not exposed to the same amount of irritation by dirt, soil, etc. Moreover, Eczema of the hocks and knees is more in the form of a chronic squamous Eczema.

Etiology.—From constant movement of the skin of the lower extremities, it is more predisposed to the development of this disease. On account of the constant motion in the horse, the skin of the lower parts of the limbs is exposed to the irritating effects of filth and dust, such as along dirty roads or in filthy stables; and dampness and cold. Because of the wet and cold, this disease

prevails more especially during the rains and in winter. The hind feet, being more exposed to the irritating action of filthy standings, are generally more subject to the disease. Prietsch (*Sächs. Jahresbericht*, 1884) has found that this disease prevails also as a result of sprinkling salt on the tramway lines during the winter months. And the practice of cutting the tuft of hairs from the back of the fetlock-joints in coarse-bred animals observed in European countries, especially deprives natural protection of the parts and frequently leads to the disease.

Straub (*Repertor.*, 1853, p. 213) has recorded the occurrence of traumatic Eczema in these parts noticed in Army horses that were exercised over recently cut fields, which resembled more a form of infectious inflammation of the skin than simple Eczema. This form of disease resembled, somewhat, the ordinary Eczema of the horse, and was characterised by a large number of small skin sores, which were followed in aggravated cases by Erysipelas and phlegmonous inflammation of the skin. This infectious dermatitis does not occur as a rule, except when the eruptions burst, or when cracks occur in the skin, allowing access to septic matters.

Symptoms.—It appears in many typical forms. First of all the skin is much congested, swollen, painful and hot to the touch (*stadium erythematosum*); and small, clear blisters follow on this (*stadium vesiculosum*), which burst, and a watery yellow, at first odourless, liquid flows (*stadium madidans*). The swollen skin, by the movement of its thick folds during the animal's motion, cracks, and contractions set in. The cracks in most cases take on an inflammatory action, and in a short time again become covered by a dry scab, causing a matting together of the hairs and depilation.

The disease either heals at this stage, or, as more often happens, gives rise to a chronic thickening of the skin, accompanied with chronic squamous Eczema. After a time it may assume an entirely new aspect. During its latter stages a peculiar discharge from the surface of the skin may be noticed, which bathes the epidermis. As a consequence of this, we find a colourless, adhesive substance, accompanied with fœtor, completely covering the affected skin, and which, finding access through the cracks, causes chronic thickening of the skin.

Formerly the disease was known as tubercular inflammation, hypertrophied Eczema, etc. This thickening of the skin can, in the course of time and in rare instances, assume the characters of Elephantiasis, and a chronic squamous Eczema may also be seen to develop on the surface of the swelling.

Treatment.—The treatment will vary according to the stage of the disease. In the beginning, cleanliness and dryness, together with dressings of oxide of zinc powder, or of zinc ointment, will

suffice to effect a cure. In the advanced stages, more energetic means will be necessary, but principally astringents to cause it to subside: alum, charcoal, etc., are the agents most commonly employed, and are generally attended with good results. Iodoform has also been recommended. But when the induration and hypertrophy have once set in, no treatment is generally of any avail. Surgical means alone may be resorted to with any hope of success.

Cattle-Eczema, Foot Eczema, Foot-Itch.

It is not always easy to distinguish Filth-Eczema from Foot-Eczema in cattle. Many causes may lead to very similar skin diseases in cattle which are difficult of diagnosis, although they may be quite different diseases. In the horse, Filth-Eczema is brought on by local causes, as uncleanliness, bad grooming, cold or dampness, etc. Horses when fed on rotten potato leaves also suffer from a special Eczema, which is a different disease to Slush or Filth-Eczema.

We regard the special Eczema as a toxic exanthema, analogous to exanthema due to chemical agents, for example, the Mercurial Itch, which in the case of the potato-plant remains up to date an undiscovered agent. Whatever the poison that is in it, it excites a peculiar vesicular exanthema.

The true specific Eczema has been known only since the last sixty odd years. Spinola first met with it in the year 1827, and gave an accurate description of it in 1836.

Male and entire animals appear more disposed to take this disease than are female ones; it is extremely rare, for example, in the cow. Some animals show an individual predisposition to it, whilst others fed on the same food-stuffs possess an immunity against it. This disease appears chiefly between spring and early summer months, or when potatoes are abundant. The hind feet are usually affected first; less frequently it begins in the fore; in others, all four feet become affected simultaneously. It may appear also on the gluteum, the neck, and other parts. It occurs in the cleanest stables, and under the best management.

Etiology and Pathology.—In most cases it is brought on by feeding the animals on potato plants, and hence one may speak of it simply as a "potato-plant disease." Corn and maize refuse may also produce a special form of Eczema, and is chiefly seen in brewery animals. The gravity of the disease varies according to the length of time the animals have been fed on such food-stuffs. The nature of the soil on which potatoes are grown also influences the severity or otherwise of the eruptions. Even cooked potatoes have this power of producing the eruptions, thus showing that cooking does not remove the poison. The latter, digested with

the potato, gets absorbed into the system, and exerts its irritant action upon the skin. In the cow, the skin is seldom affected, the whole of the poison being removed from the system by the milk, which again exerts an irritant action on the skin of the calf (Johne, *Sachs. Jahresbericht*, 1877, pp. 148-210). Children drinking this milk suffer from similar eruptions (Hering, *Jahrbuch. für Kinderheilkunde*, 1873). Sometimes the eruptions appear all over the body, especially where the skin is of a finer texture.

From the first the disease has been considered to be due to potato-poisoning. Chemical analyses have failed to demonstrate the nature of the poison. Rabe calls the malady *Dermatophagus bovis.* Zurn says that it is caused by the action of the bacteria of spirit fermentation, which, first of all acting on the intestinal canal, get absorbed into the circulation and produce irritative changes in the skin. Johne finds that the poison is present in all forms of brewery refuse, and is therefore not confined to the use of potato plants; that it is independent of all these causes, and may be looked upon as due to simple animal filth, although it may occur in parts of the body where this kind of filth does not usually come in contact. In animals which have developed this disease from filth, it has never been contagious.

Rabe considers the disease is contagious, and calls it *Dermatophagus bovis.* He finds it is of an intermittent character. Johne believes it to be a simple, spontaneous disease, which occurs in healthy animals.

Symptoms.—There is congestion and swelling of the skin of the fetlock-joint, with stiffness in the joint, and tension of the skin, more especially noticed in the hind legs. The skin is painful and shows small vesicles. The latter soon burst and run together, being replaced by a sore, wet place. When they dry up, a thick crust forms over them, and the hairs are matted together in bunches. The edges of the sore appear more or less thickened. Frequently the eruptions extend to the shin and even as far up as the knee. In male animals it extends along the inside of the thigh to the scrotum. In cows, it attacks the udder. In rare cases, all parts of the body are attacked. The skin becomes swollen, tense, and shows cracks, discharging a watery exudate, which partly dries up into scabs and partly becomes purulent in character. The disease is attended with slight fever, impaired appetite, dilatation of the anus, injection and œdema of the conjunctiva, ptyalism, etc. During a protracted course of the malady, diarrhœa often sets in. The animal becomes emaciated and weak, which in severe cases may terminate in death; but when carefully treated, the disease is generally averted within a few weeks. Through the shedding of the hairs, the epidermis is also

removed. In neglected cases, a severe erysipelatous and phlegmonous and gangrenous inflammation of the skin may set in, leading to permanent destruction of the skin. It also leads to septic infection of the other organs, by metastasis.

Diagnosis.—It may be mistaken for many other forms of skin disease attended by itching.

(1) Filth-Itch, which is very like the Potato-Itch in appearance; but the Filth-Itch has quite another etiological origin. It has no connection with feeding on potatoes or on corn plants, etc., but is due to more local causes. It is also more acutely pruriginous. When the animal is not being fed on potato plants at the time, the disease must be regarded as the Filth-Itch.

(2) Dermatophagus bovis also brings on the Foot-Itch. Foot-Itch and Potato-plant-Itch may frequently complicate each other. Thus an animal may already have the Foot-Itch on the hind legs, when the Potato-plant-Itch complicates it. Microscopic examination shows they are distinct. The first is a prolonged but mild eruption, and very seldom spreads beyond the fore limbs. Its character is that of a chronic, squamous Eczema. The Potato-Itch is an acute, vesicular Eczema.

(3) Foot-and-mouth Disease is also a vesicular Eczema. It appears only between the cleft and on the coronet, and is very infectious, and has no relation to feeding on potatoes. The Foot-and-mouth Disease and the Potato-Itch may, however, be complicated.

Treatment.—The best remedy is to stop the allowance of potatoes at once. Dr. Marker recommends combining maize with the food-stuffs, which effectually prevents the disease. Exercise is also beneficial in curtailing the advance of the disease. Rabe recommends tar and soap ointment made of 1 pt. tar, 2 pts. soap, 1 pt. sulphur, and 2 pts. brandy, with 5 per cent. carbolic oil. Others use astringent lotions, as pulv. oak-bark, decoction of oak-bark, sugar of lead, sulphate of copper, etc., and cleanliness.

A FEW MORE THOUGHTS ON INFLUENZA—WHAT IS IT?

BY THOMAS GREAVES, F.R.C.V.S., MANCHESTER.

In my former paper on this subject I propounded the above question; to my thinking, it has not yet been satisfactorily answered. I said that it was attributable to atmospheric influence, but what that atmospheric influence exactly is does not appear. That it is a pestilence of a malignant and subtle nature is admitted, but whether it is a microbe floating in the air, generated spontaneously,

or emanates from different animals affected is not to my mind at all clear; or whether it is any emanation out of the earth, that permeates the interstices in the air and is carried by currents all over the land, are matters not yet clearly explained. I hoped our scientists would have defined what the nature of this atmospheric influence really is. We find the horses affected in one locality to be far more virulently attacked than others in other localities. I think this goes a long way to prove that the atmosphere is surcharged more in one place than in another. We find horses that have not been out of the stables for weeks and months attacked, and have it in a very virulent form, notwithstanding they have not been near any other horses or any other horses been near them. I am now speaking of this one form of Influenza commonly called Pink-eye, where we have accelerated feeble pulse, cold ears, eyes closed, temperature increased, loss of appetite, swollen limbs and sheath, stiffness, and weakness.

We may have Influenza at all seasons of the year. I have seen numbers of outbreaks during the last fifty-six years; but what is the nature and true cause of this special affection called Pink-eye if it affects horses in clean, well-ventilated stables? I do not find that any kind of disinfectant is of any avail, but I feel pretty clear on this point, that horses that have been living for some time in ill-ventilated stables, breathing an atmosphere impregnated with foul emanations from drains in the stable, are much more liable to contract the disease, and when attacked succumb sooner than others. During this winter we have been visited by this epizootic, which in places has been very destructive of life; during this winter we have had intensely cold, foggy weather, giving the horses deathly chills, which no doubt added much to the increased death-rate. We know it is a fact, if we take a mouse and drop a few drops of ether upon it, that it soon dies, owing to the rapid evaporation robbing it of caloric; if we wrap a blanket saturated with ether round a man, the effect is the same—the chill is so great that he will shortly be deprived of that portion of vital heat essential to existence. Now, during December, January, and part of February the cold was, most days, very severe, and the fog was very dense; it enveloped and wrapped the horses like in a wet blanket. This would rob them of caloric; but it did another thing also—in a great many cases there was an inability to breathe; the process of inspiration and expiration was next to impossible; in short, a state of apnœa or asphyxia took place, and death was the result.

Now, we all remember the great losses incurred two or three years ago amongst those grand, beautiful, valuable prize animals that died or were destroyed in the Agricultural Hall whilst being

exhibited in that great show during a fog of unusual density; there were no microbes there, there was no diseased blood there, no Pink-eye there, but simply and purely an inability to breathe. At the same time they were robbed of their natural caloric; there they stood gasping for breath and struggling for life, exactly as I have seen some young, strong, sound, valuable horses struggling for life and die before my eyes this winter. *Post-mortem* appearances precisely the same, unless in some old horses, in whom there might be more or less disease of old standing in the lungs or liver, or both. In some cases we may find weak hearts—naturally, the walls of the heart thin; still, both it and every vital organ in the body might be in a perfectly sound, healthy condition, and in which death could only be attributable to failure of the heart's action, ending by degrees in "fatal Syncope," the *post-mortem* in nearly every case showing exactly the same in each case: the black blood is heaped up in the ventricles, auricles, and large blood-vessels, as if endosmosis and exosmosis had been entirely suspended.

I am about instituting some experiments with pure oxygen in the air they breathe, to stimulate exosmosis and endosmosis. I do not profess to have any special talent, nor have I had any special training to carry out these investigations or researches; but since our scientists and those who have had special training do not seem to undertake it, I can only do my best, and hope for a beneficial result.

Editorial.

INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY.

This important International Congress in London has now been definitely settled, and the inaugural meeting has been decided to take place on August 10th in St. James's Hall, under the presidency of the Prince of Wales, the sectional meetings being held on the five following days in the rooms of the learned societies at Burlington House. At a meeting of the General Committee, which recently took place, His Royal Highness announced that the Queen had graciously consented to act as patron. At the same meeting it was also intimated that the following, among others, had become members of the Honorary Council: The Secretary of State for India; the Presidents of the Royal Colleges of Physicians and Surgeons of England, Edinburgh, and of Ireland; the Faculty of Physicians and Surgeons, Glasgow; the Governor of the Apothecaries' Hall, Ireland; the Presidents of the Royal College of Veterinary Surgeons, the Royal Society, the Statistical Society, the Royal Medical and Chirurgical Society, the British Medical Association, the Chemical Society; the President-elect of the British Association for the Advancement of Science; the Director-Generals of the Army and Navy Medical Departments; the Presidents of the Society of Medical Officers of Health, Public Health Medical Society, Epidemiological Society, University College; the Principal of King's College; Sir Lyon Playfair, Sir James Paget, Sir Henry Acland, Sir Thomas Crawford, Sir George Paget, Sir Frederick Abel, Sir Guyer Hunter, Miss Nightingale, Professor Frankland, Dr. Cameron, M.P., Mr. Shirley Murphy, Dr. Alfred Carpenter. One hundred and sixty-five delegates had already been appointed by municipal and other bodies throughout the country, and from some of them preliminary invitations had been received to view the sanitary works under their care.

On the General Committee are Professor Brown, C.B., Dr. Fleming, C.B., Professor Duguid, A. C. Cope, and as delegates of the Royal College of Veterinary Surgeons, Professors McCall and Axe.

The section which will most interest veterinary surgeons is that dealing with the relations of the diseases of animals to those of man. This is under the presidency of Sir Nigel Kingscote, K.C.B., Chairman of the Board of Governors of the Royal Veterinary College, and the Vice-Presidents are Professor McCall, F.R.C.V.S., Professor Brown, C.B., and Professor Klein, F.R.S.; while the Secretaries are Professor

Duguid, F.R.C.V.S., G. Sims Woodhead, M.D., F.R.S.E., and E. Clarke, Secretary of the Royal Agricultural Society, to whom all communications are to be addressed.

In this section arrangements have been already made for papers to be read on Meat Infection, by Dr. E. Klein, F.R.S., and Professor Gaffky, of Giessen; on the Inspection of Meat, by Dr. Francis Vacher; on Animal Parasites Communicable to Man, by Professor G. T. Brown, C.B., and Professor Rudolph Leuckart, Leipzig; on the Regulation of Milk Supplies, by Mr. Shirley Murphy, M.O.H., London; on the Intercommunicable Infectious Diseases of Animals and Man, by Professor Crookshank and Professor Perroncito, of Turin; on the Propagation and Prevention of Rabies, by Dr. George Fleming, C.B.; on Anthrax, and its Relations to Workers in Various Trades, by Mr. W. Duguid and Professor Chauveau. A discussion will also be held on "The Relations of the Consumption of Milk from Dairy Cows suffering from Infectious Udder Disease to Epidemic Disease in the Human Subject."

In Section II., which will discuss bacteriology, one of the chief subjects is "Tuberculosis in Man and Animals," and this will be the occasion for a conjoint meeting between it and the above section, in order that the question of danger to the public health from the consumption of the flesh and milk of tuberculous animals may be more fully debated.

It will thus be seen that the Congress is an important one for the veterinary profession, which has had allotted to it a fair share of representation and work in this great gathering—a circumstance without parallel in the history of veterinary medicine in these islands. It is to be hoped that members of the profession will endeavour to muster in large numbers on this occasion, which we presume they will be privileged to do by contributing a small sum to the funds of the Organising Committee. The General Secretary of the Congress is Dr. Poore, 20, Hanover Square, W., to whom subscriptions should be sent.

PHYTOPATHOLOGY.

Dr. Charles Bagge Plowright, in the first of his lectures at the Royal College of Surgeons on "Parasitic Fungi in Relation to Plant Disease," said that the recognition of the important part played by these fungi was only of recent date; only within the past twenty years had the subject really been grasped. Fungi might be saprophytes or parasites, or partly parasitic and partly saprophytic. Plant disease of parasitic origin was almost always local, although the local lesions might be so numerous that the host-plant was killed. Nothing analogous to the zymotic diseases could be said to exist. True heredity did not play so important a part in the etiology of fungoid plant disease as in the case with animals. Certain varieties of wheat were more liable to mildew; certain kinds of apple—as the ribstone pippin—to canker; certain varieties of potato to the potato disease. But these were more instances of the constitutional peculiarity of varieties than true heredity. Just as was the case with Cholera, and with Measles in Iceland, the Faroe Islands, and the Fiji Archipelago, so with regard to epidemics of fungoid plant disease, as shown by the potato disease, which, on its introduction in 1845, threatened to exterminate the potato. So also with the

hollyhock disease, which first appeared in this country in 1873, and for several years threatened to annihilate this flower; although the disease was still present, yet the hollyhock was beginning to reappear in our gardens. The celery disease (puccinia apii) was another instance.

One of the most frequent effects of the presence of the mycelium of a parasitic fungus in a plant was to cause hypertrophy. This might be general, as in the foliage of the common garden anemone when it was infected with œcidium punctatum. Cruciferous plants attacked by peronospora parasitica became so hypertrophied as to recall elephantiasis. Local hypertrophies were more common. They might occur in any part of a plant—leaves, stems, fruit, woody tissues, or roots. The remarkable tumours caused by the American gymnosporangium macropus, called "cedar apples," produced by the mycelium entering through a leaf into the very smallest branches, was an instance in point. Allied species of gymnosporangium also produced local hypertrophies of smaller size and slower growth—the former existing for one season, the latter lasting for years—thus affording a parallel to the well-known fact that in the human subject rapidly-growing tumours tended to die sooner than slow-growing ones. Phytopathology afforded many instances of local death of a part produced by the parasite, accompanied by hypertrophy of the surrounding parts. Such were the larch disease (*Peziza Willkommii*), the apple tree canker (nectria ditissima), and the black knot (plowrightia gibbosa). Possibly the nearest approach to malignant disease was afforded by the "finger and toe" (*Plasmodiophora brassicæ*), in which the parasite produced local tumours, tending to multiply, containing elements not found in the healthy tissues of the plant—the plasmodia—and eventually breaking down into fœtid, pultaceous masses.

Many plant, or rather tree diseases, were of traumatic origin—the epidermal structures having been removed, and the vital tissues beneath exposed, a suitable nidus was offered for fungoid parasites. These injuries might be caused by accidental fractures, by wind, bites or scratches of animals, frost cracks, sun cracks, blows from hailstones, etc. The well-known canker caused by nectria ditissima on apple, beech, oak, elm, and other trees was an instance. Here the parasite destroyed a portion of the bark, cambium and woody tissues, in a similar manner to the peziza willkommii before mentioned as the cause of the larch disease. Many hymenomycetes, such as polyporus sulphureus, dryadeus, and igniarius, were well-known examples of these wound parasites. Polyporus squamosus and allied species produced a condition of the wounded surface resembling caries, and requiring for its treatment surgical measures, namely, enlargement of the wound, gouging out the softened wood, swabbing the cavity with strong carbolic acid, and, to prevent the re-entry of fungus spores, stopping it with cement, as a dentist stops a carious tooth.

Agaricus melleus and polyporus annosus were capable of entering the roots of pine trees and causing the death and decay of the interior of the trunk—producing gangrene, in fact. Atrophy was caused in shoots of fir trees by uredo pinitorquum, and of the wheat kernels by puccinia graminis—the wheat mildew. The mycelium of puccinia suaveolens rendered young plants of the common thistle anæmic, while the uredo linearis produced a state of plethora in wheat plants. Sterility of the host-plant was a common effect of fungoid parasitism, especially with the ustilagmeæ, and many plants containing perennial mycelia failed to develop their inflorescence.

In conclusion, the effect of the mycelium of parasitic fungi might be summed up as Seymour had done: the parasites injured their host plants (1) by depriving them of nourishment; (2) by impairing their power of assimilation; (3) by abnormally accelerating or retarding their growth, and thus causing distortions.

CURES FOR INFECTIOUS DISEASES.

BY E. H. HANKIN, B.A.,

Fellow of St. John's College, Cambridge; Junior George Henry Lewes Student.

OUR knowledge of the nature of the conflict between the organism and the microbe has now so far advanced that, of the numerous "cures" that have been attempted, a partial explanation of the *modus operandi* of the curative agents can in many cases be brought forward. Such "cures" can be roughly divided into two classes; (*a*) those in which a "febrile reaction" is probably produced, and (*b*) those in which a bactericidal substance is introduced into the living animal body.

Of the first of these classes a good example is to be found in Buchner's method of curing anthrax by injection of sterilised cultures of bacillus pneumoniæ.* The living anthrax microbe and the sterilised pneumonia culture were subcutaneously injected in different parts of the body, in order to exclude as far as possible the direct action of one upon the other. About 50 per cent. of rabbits treated in this way completely recovered. It was found that the sterilised cultures of Friedländer's pneumonia bacillus produced a rise of temperature when injected into healthy rabbits, and not only this but also other febrile symptoms when injected into the experimenter himself. In 1887 Emmerich† succeeded in making rabbits refractory to Anthrax by inoculation with the Erysipelas microbe. Probably here again a stimulation of the febrile reaction occurs. In a certain number of cases I have succeeded in curing rabbits of Anthrax by injections of minute quantities of pepsin or trypsin.‡ Hildebrandt § has lately shown that these substances, besides various poisonous symptoms, produce a rise of temperature.

It is well known that if rabbits are inoculated with very virulent Anthrax, as a rule no rise of temperature takes place, and the animal dies within a couple of days. Inoculation with less virulent Anthrax is often attended with a rise of temperature, and the animal may only succumb after a longer struggle with the microbe. Only if the rabbits have been made immune against Anthrax is an inoculation with the virulent bacillus followed by a rise of temperature. I have found that when the animal's power of resisting the onset of the disease has been increased by injecting a "protective proteid," a febrile reaction occurs, and on the death of the animal the bacilli showed various signs of degeneration.

In all these cases it appears that the increased power of resisting the attack of a pathogenic microbe is attended with the appearance of a "febrile reaction." What is the nature of this "febrile reaction"? A great many speculations and but few facts have been brought forward to explain its action.‖

It has been supposed that the temperature *per se* exercised a harmful action on the microbes present. Bouchard ¶ has shown that this explanation does not hold. He once found virulent anthrax bacilli in a rabbit, whose

* Buchner: Ueber Hemmung der Milzbrand Infection und ueber das aseptische Fieber, *Berliner klinische Wochenschrift*, 1890, No. 10.

† Emmerich: *Archiv. für Hygiene*, vol. vi. 1857, p. 442.

‡ Hankin: A New Result of the Injection of Ferments, *Proceedings of the Cambridge Philosophical Society*, November 11th, 1889, vol. vii. p. 16. *Virchow's Archiv.*, vol. 122, p. 1.

‖ See the Goulstonian Lectures on the Nature of Fever, by Dr. Donald MacAlister, Fellow of St. John's College, Cambridge. (London: Macmillan and Co., 1887.)

¶ *Actions des Produits sécrétés par les Microbes Pathogènes.* (Paris: Gautier Villars et Fils, 1890.)

inoculation had been followed by a rise of temperature to 44° C., which temperature would be amply sufficient to attenuate, and even kill, the same bacilli when growing in a test tube.

The following experiment of my own appears to throw some light on the subject, and indicates another way of arriving at an explanation of fever. A rabbit was inoculated with Anthrax; twenty-four hours afterwards it was found to have a temperature of 40·4°. It was then decapitated, and its blood allowed to flow into alcohol. After some days the precipitated proteids were filtered off, dried, and extracted with water. The extract was filtered, and it was found to have the power of killing Anthrax bacilli. This was tested by the plate culture method as used by Nissen, Nuttal, and Buchner. In several other experiments I equally succeeded in extracting a bacteria-killing substance from febrile blood. From normal blood, on the contrary, I could not by this method prepare a solution having bactericidal powers, except in one or two cases and then to a very slight degree.*

From these experiments it may be surmised that the "febrile reaction" is in some way connected with the appearance of bacteria-killing substances in the blood; certain researches that have recently been published give good ground for hoping that the investigation of such "natural disinfectants" will lead to valuable practical results. Foremost among these researches must be mentioned the work of Behring and Kitasato on Tetanus and Diphtheria.† These investigators have succeeded in curing the above-mentioned diseases by injections of serum from animals that had previously been made immune against the Tetanus and Diphtheria bacilli. In this case, however, the serum appears to owe its curative power to a substance that destroys the poison produced by the microbes rather than the microbes themselves.

Other researches recently published show that the serum of naturally immune animals can be used to confer insusceptibility to a disease. Behring‡ in an article on Disinfectants, in the current number of the *Zeitschrift fur Hygiene*, mentions that he has made mice immune against Anthrax by injection of rat's serum. Ogata and Jasuhwara have recently published in the *Proceedings of the University of Tokio* (Japan) a paper entitled "The Influence Exerted by the Blood of Various Animals on the Anthrax Bacilli." They have succeeded in curing mice from the attenuated Anthrax by injections of blood from dogs, rats, and frogs. They found it necessary to inject the blood within five hours after inoculation. I have recently obtained similar results by injection of rats' serum, and have found that the injection of so small a quantity of serum as 0·01 cubic centimetre was sufficient to preserve a mouse from exceptionally virulent Anthrax. In one experiment, eight mice were inoculated with rat's serum, in quantities varying from 0·01 to 0·11 cubic centimetre, and in the same place with virulent Anthrax spores. All of them remained in good health, while two control mice died within eighteen hours.

That this result is not due to a "febrile reaction" was shown by another experiment in which ten mice were used, and in which the serum and spores were injected at different parts of the body. In this way the direct antiseptic action on the Anthrax spores was diminished, and in this experiment every

* Hankin: Indications for the Cure of Infectious Diseases, read at the Leeds meeting of the British Association for the Advancement of Science, 1890.

† Ueber das Zustandekommen der Diphtherie-Immunität und der Tetanus Immunität bei Theiren *Deutsche medicinische Wochenschrift*, No. 49, December 4th, 1890, p. 1113; also the Production of Immunity to Tetanus and Diphtheria, *British Medical Journal*, December 13th, 1890, p. 1395.

‡ Ueber Disinfection und Disinfectionsmittel, *Zeitschr. f. Hygiene*, vol. ix., 1890, p. 473.

mouse died, though from one to three days later than the controls. The latter, as in the other experiment, died within eighteen hours.

What are the substances to which these curative actions are due? Apparently they belong to a class of bodies which I have called "protective proteids," and which I described in the *British Medical Journal** nearly a year ago. By the methods described in the article referred to, I have isolated the protective proteid from both the spleen and blood serum of the rat, and with it I have succeeded in rendering mice insusceptible to Anthrax.

I find that this substance is a globulin which (so far as I know) stands alone among bodies of this class in giving an alkaline reaction, even after prolonged dialysis against normal salt solution. Since it is only soluble in dilute salt solutions, the alkaline reaction vanishes by dialysis against distilled water, to return on the addition of a small quantity of pure sodium chloride. A further account of my experiments with the rat's defensive proteid will shortly appear in the *Centralblatt für Bakteriologie.*

RABIES AND MUZZLING.—AN ANSWER TO CRITICISMS.

BY THOS. B. GOODALL, M.R.C.V.S., CHRISTCHURCH, HANTS.

[The following remarks were written in reply to criticism on the paper on "Rabies and Muzzling" which appeared in the *British Medical Journal*, but which the editor of that periodical did not think fit to publish, as the opinion expressed probably did not coincide with his own. Opinions *pro* and *con.*, however, should be heard on such an important subject, for it is only by free discussion that truth can be finally elicited.]

The pamphlet, "Rabies and Muzzling," was not written in a hurry, nor, as you suggest, without availing myself of the researches of others. I have not only done this, but I have also made use of knowledge, unadulterated by the whims, fads, and fancies of man, culled from the more lucid daily revelations of the great book of Nature, and my argument is founded on knowledge gained from this unerring source.

My allusion to the Tabanidœ, Estridœ, etc., was not without reason; it was to illustrate to thinking men the impossibility of "stamping out" any indigenous form of parasitic life unless every source on which that organism depended for its existence was also destroyed.

From the literature we have on the subject, we must admit that the organism inducing Rabies and Hydrophobia is indigenous to this island. We must also grant that its existence is subordinate to the presence here of carnivorous animals, and, therefore, if the scientific, medical, and veterinary world would advise that the organism should be exterminated, they should not stop at such half-and-half measures as muzzling for a few days, but the whole family of the carnivora must be extirpated. Or, if man is to be efficiently safeguarded, without recourse being taken to such drastic measures, then scientific men must know that no temporary or partial muzzling of a few dogs at such times only as when they are allowed to be in a public place can be productive of any permanent good results. If a law is to be promulgated for the safeguarding of mankind from the infinitesimal risk he runs in adhering to the companionship of his truest and best of friends, then the muzzling order should be made *permanent*; that is, every dog in the island, no matter what his breed or use, should be made to wear such a muzzle as to make it impossible for him to use his teeth so as to be able to inflict a wound on another creature or man, and this muzzle should never be removed as long

* *British Medical Journal*, July 12th, 1890, On the Conflict between the Organism and the Microbe.

as the dog lives. A muzzling order that has for its object the protection of the human race from Hydrophobia, and that falls short of this, must be regarded by such scientific men as care to give the matter a thought, as inadequate, and if such a law as I have outlined is not practicable, then I maintain that any other muzzling order for the suppression of Rabies is illusionary.

I am just reminded by a sad case of reported Hydrophobia not far from here, and supposed to have been contracted by an unfortunate child having been bitten by a cat, that the felines should also be embraced in the Order if we are sincere in our determination to "stamp out" Rabies by these means.

We occasionally hear of deaths through children eating poisonous berries or from persons being stung by a wasp, or bitten by a gnat, but we do not immediately pass a law for the extinction of the bryony, or for the complete destruction of all wasps and gnats. If such a law were passed, could we, think you, rid ourselves of these things?

When I allude to the comparatively rare occurrence of Hydrophobia in man, I affirm that it is one of the rarest diseases by which mankind is afflicted. In proof of this, I would point out how very few medical men have ever seen a case, and I mean to infer that it is not of such common occurrence as to warrant scientists to advise such a sweeping measure as the extermination of the canine race, which is man's only safeguard.

The law, as it at present exists, is found to be inequitable more in rural than in urban districts. In your criticism you mention that dogs may now be used for the destruction of vermin. If we are seriously in earnest in our endeavour to "stamp out" Rabies by the use of the muzzle, is it possible to conceive a more ludicrous law than this? A man may take his dogs on a certain road without being muzzled for the purpose of killing rats. If he wishes to take a quiet walk along the same road an hour or two afterwards with his dog for a companion, he must then apply the muzzle, or be liable to prosecution. Is the dog more safe when rat catching than when walking quietly along the road? Speaking again from my own experience and observation, I know as a fact that if the disease is latent in the dog excitement will accelerate the developement of the symptoms, and therefore the dog is more dangerous when being used for the destruction of vermin, or for "sport" of any kind, than walking quietly with his master.

The argument in my pamphlet is, that if muzzling is to be effective it must also be *continuous*, and if this were made law, then it would be an offence to keep a dog at any time without a muzzle.

In urban districts the case is different. There the dog is kept in an unnatural environment, and to me he always looks more or less miserable. In thickly-populated towns dogs should not be allowed in a public place without being under the control of some one. My grievance is that the framers of these laws and the people who now advocate their continuance so perseveringly, must be, most of them, "dwellers in cities" where they only see the dog in the unnatural state I have pointed out, and I must hold that a strictly enforced registration, in the lines suggested by me, would fulfil every requirement, both in urban and rural districts.

You make allusion to the inglorious termination of the trial of registration in Bradford. I am prepared with an equally ignominious case against muzzling.

The muzzling order has been in operation in a certain fashionable watering place for upwards of six months, and after this length of time we have three undoubtedly rabid dogs. One of these, though muzzled, bit others; which were of course destroyed. Luckily no human beings were bitten; but it is quite as good a case on the side of registration as the Bradford one for muzzling. You may twit me here by saying the muzzling order was not pro-

perly carried out; my reply would be that the registration regulations at Bradford were not in proper working order.

The fact of the non-existence of the disease in Australasia, and its being kept out of that part of the globe by quarantine, is in no way analagous to our own case. There it has never been known to exist; *here it is indigenous.*

Where outbreaks have been suppressed by the enforcement of the Muzzling Order, it has been due to the destruction of affected animals, and of those that have been under no control, but *not* to the fact of muzzles (preventing dogs more or less from biting others) being applied to their heads.

As a proof that the disease may be as readily "stamped out" for the time being without the muzzle as with it, I give my experience of a case that came under my own observation some ten years ago. A rabid dog, a stranger, wandered through this place and bit several others. They were all traced and destroyed, and we have not had a case from that day to this.

I cannot believe that it is the thinking part of the scientific world who are advocating these puerile methods of meeting this dire disease. The muzzling scare will soon be looked upon as a relic of imperfect knowledge, and in the great discovery of Koch we have a clue to the source of our protection.

In the great cycle of life *every* organism is kept under control by some other, and we shall find that even the organism inducing Rabies and Hydrophobia has its natural foe. This is what the scientific, medical, and veterinary world are setting themselves to learn, and it is more rational than the irksome and useless law compelling the application of the muzzle to a few dogs in certain localities on the slightest ground for a "scare."

NEW MICRO-ORGANISM FOUND IN WATER.

Dr. Giuseppe Sanarelli (*Centralbl. f. Bakt. u. Parasitenk.*, Bd. ix., Nos. 6 and 7, 1891) in the course of experiments on the behaviour of Anthrax in the lymph sacs of the frog, found, in a certain spring, an organism, the bacillus hydrophilus fuscus, that was pathogenic for both cold and warm-blooded animals. When cultivated from the blood or lymph of the frog on agar plates numerous round, smooth, greyish white colonies make their appearance in from twelve to twenty-four hours; these had a somewhat bluish translucent margin. Grown in agar tubes there is a bluish fluorescence along the needle track, and gas bubbles are sometimes developed. At the end of three or four days the fluorescence disappears, the growths become brown in place of white. The rodlets examined from such a cultivation are small, but motile; length 0.001 to 0.003 millimetres. Some are short and egg-shaped; the longer ones have usually a delicate transverse mark, as though of commencing division. The organism liquefies gelatine very rapidly, the liquefied gelatine being cloudy and funnel-shaped. In three or four days this liquefaction is complete, and there is a profuse white deposit or precipitate. The organisms contains more long threadlike forms, some of them reaching 0.02 millimetre in length; it liquefies serum, causes cloudiness in broth, which is followed by the formation of a white film on the surface. On potatoes it grows after about twelve hours as a straw-coloured film, which then becomes yellow, and later brown, very like the Glanders growth on potatoes. It can be distinguished from Glanders and pyocyaneus growth on potatoes by the addition of a twenty per cent. solution of bichloride of mercury by the following reactions; Glanders, yellowish; pyocyaneus, greenish blue; fuscus, milky, somewaht reddish in the middle. The organism is equally infectious on whatever substance it is grown. It was found twice in waters taken from twenty-

six sources. When injected into the parenchymatous tissue of frogs, toads, salamanders, lizards, barbel, and fresh water eels, it is distinctly pathogenic, usually killing them with signs of great local inflammation and congestion of the various internal organs, and hyaline and granular degeneration of the muscles. The organism is easily stained with a saturated solution of methylene blue in a one per cent. solution of osmic acid. It will not stain by Gram's method. The bacilli were found in groups, and within large leucocytes. It was noted that the stronger the local reaction was the later death set in; in eels this was very marked, large gangrenous swellings being formed in animals that survived some thirty-six to forty-eight hours. Guinea-pigs are very susceptible to the action of a small quantity of the virus; they are killed in about twelve hours. In one case a rabbit died three hours after subcutaneous injection. Puppies die in from twelve to thirty-six hours after inoculation, but old dogs are apparently unaffected. Kittens are readily affected, but full-grown cats, although there are marked local symptoms, may recover from the disease. White mice die in from seven to eight hours, bats in from five to six hours, hedgehogs in eighteen to thirty-six hours; fowls and pigeons can only be infected directly through the blood, when they die in from five to seven hours. In animals that die of this disease the bacilli are found in great numbers in both the organs and in the blood, and especially in the subcutaneous œdematous point. They may be in twos or threes, or in chains. This organism is remarkable from the fact that it affects so many species and such very different animals as the warm and cold-blooded. Its action is, apparently, not due to any toxine that can be separated by filtration. In contra-distinction to Ernest's observations on a somewhat similar organism, Sanarelli finds (1) that the bacilli fuscus flourishes luxuriantly and retains its infective properties at over 30° C.; (2) that it develops quickly in warm-blooded animals; (3) that filtered but not boiled cultures cause no symptoms of poisoning when they are injected in ordinary doses.—*British Medical Journal.*

BACTERIOLOGY OF TETANUS.

MM. L. VAILLIARD and H. VINCENT make a contribution to the study of Tetanus (*Annales de l'Institut Pasteur*, January, 1891), in which they bring out a number of most important points. Using a modification of Kitasato's method, they were able to obtain pure cultures of the Tetanus bacillus, the colonies of which, growing in gelatine *in vacuo*, appear on the fourth or sixth day as small cloudy spheres, each of which has a whitish point in the centre, the peripheral cloud being formed of white rays. Bubbles of gas appear near these colonies, and in ten to fifteen days liquefaction of the gelatine occurs. Under the microscope the characteristic "drumstick" shaped organisms, rods without heads, or long filaments were seen. They found that these organisms, though originally anaërobic, may by a gradual transition be rendered capable of growing, and even of remaining, pathogenic in the presence of a small quantity of free oxygen. The bacillus requires some time to develop its typical poison, especially if the temperature be not quite favourable, growths of the bacillus not being toxic until about the tenth day when the temperature is kept at twenty to twenty-five degrees C., but eighteen-hour cultures are toxic when the growth is carried on at from thirty-eight to thirty-nine degrees C. Here also, however, the growth becomes more virulent up to the tenth day. The artificially-prepared media are better for the culture of the bacillus than such substances as aqueous humour and fluid blood serum. Until the growths form spores, give rise to liquefaction of the gelatine, and the characteristic smell is given off, they are non-pathogenic;

but as soon as these make their appearance the pathogenic activity also steps in. The organisms are slightly motile until the terminal enlargement is formed. Old cultures may remain alive for six months, the spores withstanding eighty degrees C. for six hours, ninety degrees C. for two hours, and one hundred degrees C. for three or four minutes. Light and air acting on dried organisms kill them off comparatively rapidly. Mice and guinea-pigs are very easily affected, but the poisonous dose for rabbits is about two hundred and fifty times as large as that required to kill these other animals, in addition to which the course of the disease is much slower. The poison appears to act directly on groups of muscles near the point of inoculation. Although the organism can grow in pus and in the earth, pure cultures are very rapidly destroyed at the seat of inoculation, as after twelve hours not a single bacillus could be found. The poison diffuses itself very rapidly through the body; glucose and maltose added to the fluid media increase the rapidity of the growth of the organisms, but cause a diminution in their pathogenic power. A fluid culture passed through a Chamberland filter gives a clear filtrate in which the Tetanus bacillus can still grow and form a stronger solution of the poison. If this second fluid be again filtered and twenty cubic centimetres of broth be added to 350 of the filtrate, a third growth takes place, and an extremely toxic fluid is the result, one hundred-thousandth of a cubic centimetre being sufficient to kill a mouse. It appears, however, that the organism keeps the poison stored up in its own protoplasm in the dry condition, and only gives it up to fluids. The authors consider that it is somewhat of the nature of a diastase, that it peptonises gelatine, and that in peptonising the gelatine it loses some of its toxic power, according to the amount of gelatine upon which it acts. It has, however, certain affinities with the venomous groups of poison, in that it acts in extremely small doses. So impressed were they with the extreme toxicity of the fluid that they hold that, in the case of pure cultures, the bacillus is so rapidly destroyed in the body that it is the poison which accompanies them that causes the death of the animal, and they conclude that this is the reason so many negative results have been obtained, the inoculations of young cultivations being made before the poison had had time to develop, as they found that by heating virulent cultures to sixty-two degrees C. (when, of course, the organisms were not destroyed), animals inoculated did not die, but cultures made from the same material afterwards produced a quantity of poison that might cause the death of the animal. Similarly, if spores were thoroughly washed with distilled water so as to remove the whole of the accompanying poison, they no longer gave rise to Tetanus when injected into an animal. If, however, lactic acid or trimethylamine be previously injected, or if the tissues be bruised, or if an inoculation of micro-bacillus prodigiosus be first made, and then even a smaller dose of the Tetanus spores be inoculated, the animal almost inevitably dies of the disease, so that, just as in symptomatic Anthrax, the organism, though not capable of developing alone, is, in the presence of this other factor, capable of developing and giving rise to its specific poison, and so of killing the animal. The authors have made a number of experiments, from which they conclude that the spores, when deprived of their poison, readily fall a prey to the leucocytes, the bacilli also being taken up in much the same way, and in from eighteen to twenty hours every trace of these organisms has disappeared. If, however, the leucocytes are paralysed by the presence of the poison or by the presence of any of the other devitalising influences above mentioned, the bacillus gets an opportunity of forming its poison, and so death from Tetanus is the result. It is quite possible that lactic acid, like the Tetanus poison, may prevent the coming up of the leucocytes to do the work at the point of injection, giving the bacilli an opportunity of developing, just as in ordinary culture media.

VETERINARY SANITARY INSPECTOR FOR WIGAN.

It gives us much pleasure to announce that at the meeting of the Sanitary and Sewerage Committee of Wigan on March 4th, Mr. William Woods, F.R.C.V.S., of that town, was appointed to the following offices:—Veterinary Inspector under the Contagious Diseases (Animals) Act, 1878; inspector of dairies, cowsheds, and milkshops, and inspector of cattle trucks—upon the same terms as such appointments were held by the late veterinary inspector—Mr. Woods' father.

We congratulate our esteemed friend on succeeding to these appointments, as it is only too well known that some of them, in many towns, are held by the Chief Sanitary Officer, or, as he used to be called, the Nuisance Inspector. Such appointments should be held by members of the veterinary profession, who are the most competent to discharge the onerous and important duties pertaining to them.

TUBAL PREGNANCY IN A BITCH.

A WRITER in the *Lancet* of March 14th says: Seeing in Mr. Bland Sutton's Erasmus Wilson lecture that tubal pregnancies in the lower animals are unrecorded, I think it may be worth while to note a case which I have always hitherto regarded as tubal, and which occurred in a bitch. It was a valuable little black-and-tan bitch, the property of a friend at whose house I was for a time staying. This was to be the third litter; the second had consisted of one pup only. She had been now in great pain for some hours, and was forcing out some brownish fetid fluid from the vagina. As the animal was so valued, I advised a veterinary opinion, which was obtained, the gentleman declining, however, to interfere. With a button-hook and a small sequestrum, I got away three puppies that had been dead about a week. Much gas and fluid escaped with them from the uterus. In the night the bitch died. Next morning I found, on opening the abdomen, that a pulpy mass, covered with very thin membrane, lay toward the right side, among the intestines, and attached at its lower part by a small peduncle to the uterus, which was firmly contracted and apparently normal. I opened up the mass, and found it contained much of the same sort of fluid that had escaped, and also a puppy which was macerated and had all its hair and cuticle quite loose. It was bigger, and had been more developed than the ones I removed, and evidently, from these facts, and being so much more decomposed, had belonged to a previous litter. My reasons for believing it to be tubal were that the uterus seemed normal, and that it would long before have set up peritonitis if intra-peritoneal; besides which, it was almost free in the cavity, except by the uterine peduncle and a small adhesion at the back. My investigation caused disgust in the house, and all the parts were surreptitiously conveyed away and buried; so that, unfortunately, I am unable to produce the specimen.

CANTHARIDINATE OF POTASH IN TUBERCULOSIS.

PROFESSOR LIEBRICH, of Berlin, has introduced a new remedy for Tuberculosis, in the form of a preparation of cantharides, or rather of the active principle of that agent—cantharidine—a powerful toxicant, which acts more especially on the kidneys and urino-genital apparatus, causing exudation of serum in them. The preparation is a solution containing cantharidinate of potash injected in very small doses (1 to 2 decimilligrammes for man). Good results have been reported, but great care is necessary, and at least one death has been ascribed to its employment. Cantharides at one time was lauded in this country as a cure for Glanders, and the late Mr. Vines wrote a treatise on its use for that disease.

THE JOHN HENRY STEEL MEMORIAL.

THE first meeting of the General Committee took place on the 19th of March, at the Royal College of Veterinary Surgeons. Mr. J. Roalfe Cox, F.R.C.V.S., London, was elected Chairman; Mr. F. Raymond, Hon. Secretary. The General Committee list was read. The list thus far includes the following gentlemen, and others who may be desirous of adding their names thereto are invited to notify their wish to the Hon. Sec.

Professor J. W. Axe.
J. Bell, Esq., Carlisle.
Professor G. S. Brown, C.B.
J. Roalfe Cox, Esq.
W. A. Edgar, Esq., Dartford.
J. W. Evans, Esq., A.V.D.
Professor J. McFadyean.
Dr. G. Fleming, C.B.
M. Hedley, Esq., Privy Council, Dublin.
W. Hunting, Esq., London.
J. McKenny, Esq., Dublin.
J. O. Lambert, Esq., P.V.S.
T. D. Lambert, Esq., Dublin.
Alexander Lawson, Esq., Manchester.
Principal McCall, F.R.C.V.S.
W. J. Mulvey, Esq., London.
T. Olver, Esq., Truro.
Professor W. Pritchard.
Captain B. Russell, Grantham.
C. Rutherford, Esq., A.V.D., Aldershot.
Professor Shave, R.V.C.
James Simpson, Esq., J.P., Maidenhead.
Sydney J. Slocock, Esq., Hounslow.
D. M. Storrar, Esq., Abergavenny.
Principal W. Williams, Edinburgh.
F. Wragg, Esq., London.

The following gentlemen were elected trustees and receivers of the Fund: F. Wragg, Esq., Treasurer, Royal College Veterinary Surgeons; Dr. G. Fleming, C.B., late P.V.S. Army.

The next business was to elect a working sub-Committee, and the following gentlemen were requested to serve: Mr. J. Roalfe Cox, chairman; Messrs. Wragg, Fleming, J. D. Lambert, P.V.S., J. W. Evans, A.V.D., Professor Pritchard, Messrs. J. Simpson, J.P., S. Slocock, Mulvey, Professor Axe, Professor Shave, and the Hon. Sec.

The Hon. Sec was requested to communicate with the President of each of the Home, Colonial, and Indian Veterinary Societies, with a view to obtaining their support.

In considering the best way to bring the projected memorial to the notice of the profession, the question of a printed circular to each individual member was mooted; but the idea was rejected on account of the expense. It was finally decided to approach the editors of our periodicals with a view to obtaining publicity through their kind offices.

The next question discussed was the desirability, or otherwise, of fixing a limit of subscriptions to a guinea. After some conversation it was decided to leave the matter entirely to subscribers, as the veterinary societies would probably send a larger sum, and many students who desired to assist could not be expected to contribute as much as a guinea. The Committee, bearing in mind that John Steel, although in the army, was connected with the civilian branch of the profession, and still more intimately with students born in England and India, expressed a special desire that the latter should be encouraged to come forward. So that any sum, however trifling, will be cordially accepted, the object being to raise the memorial not so much upon a small number of large payments, however welcome, as upon a large number of smaller ones.

In discussing the nature of the memorial, a difficulty at once presented itself, as the Committee were in ignorance of the amount that would be subscribed; but it was decided that the money should be expended in a prize which should be named after the lamented John Henry Steel. Professional opinion has lately shown a marked desire towards the increase of

testimonials to hard workers, as may be seen by the votes of the C.V.M.A., the N.V.S., and others. The Committee has, therefore, happily hit upon a means of meeting the aims of the profession, of helping students, and at the same time carrying out what would no doubt have been most agreeable to the deceased.

It will depend upon the amount subscribed, whether the prize shall be a scholarship, a medal, or some other appropriate form of encouragement. When coming to a final decision the Committee will duly consider any suggestions that subscribers may be kind enough to offer.

The prize will be open to all the schools. Mr. F. Wragg, 17, Church Lane, Whitechapel, London, E.C., and Dr. G. Fleming, C.B., Cathcart Lodge, Tyrwhitt Road, St. John's, London, S.E., have kindly consented to receive and acknowledge subscriptions.

With a cordial vote of thanks to the Chairman, the Committee adjourned.

F. RAYMOND, *Hon. Sec.*

Proceedings of the Royal College of Veterinary Surgeons and Veterinary Medical Societies, etc.

ROYAL COLLEGE OF VETERINARY SURGEONS.

SPECIAL MEETING OF COUNCIL TO CONSIDER THE SUBJECT OF PASSING A GRANT OF MONEY TO THE INTERNATIONAL CONGRESS OF HYGIENE AND DEMOGRAPHY, HELD MONDAY, MARCH 16TH, 1891.

Mr. W. B. WALTERS, Vice-President, in the chair.

Present:—Professors Axe, Brown, and Pritchard; Dr. Fleming; Sir Henry Simpson; Messrs. Trigger, Walters, Wragg, George Thatcher (Solicitor), and A. W. Hill (Secretary).

The SECRETARY read the notice convening the meeting.

On the motion of Professor BROWN, seconded by Professor AXE, the minutes of the previous meeting were taken as read and confirmed.

The SECRETARY stated that he had received letters from the following gentlemen regretting their inability to attend the meeting:—Professors McCall and Walley; Messrs. J. Roalfe Cox, Cartledge, Briggs, Kidd, Lambert, and Taylor.

Correspondence.

The SECRETARY said he had received letters from Sir Henry Simpson and Mr. Cartledge resigning their appointments as members of the Board of Examiners.

On the motion of Dr. FLEMING, seconded by Professor AXE, the consideration of the matter was postponed until the next meeting.

The SECRETARY read the following letter from the Honorary Secretary of the International Congress of Hygiene and Demography:—"To the President of the Royal College of Veterinary Surgeons. Sir, I am desired by the Organising Committee to ask you to allow yourself to be nominated as a member of the Honorary Council of the Congress. As the nominations will be submitted to the General Committee, which is to meet on Monday, March 16th, under the Presidency of His Royal Highness the Prince of Wales, an early reply is requested." He (the Secretary) had been directed by Professor McCall to write to the Honorary Secretary and say that he had much pleasure in accepting the office. The following summons had also been sent to Professor McCall:—"A meeting of the General Committee will be held at 20, Hanover Square, on Monday, March 16th. His Royal

Highness the Prince of Wales has kindly consented to preside, and will take the chair at 3.30 o'clock precisely. It is hoped that members of the committee will be in their places not later than 3.15 p.m. G. V. Poore, Honorary Secretary-General." Professor McCall had directed him (the Secretary) to acknowledge the letter, at the same time regretting his inability to attend. The President had asked him to read the list of names of the Section III :—"Relation of the Diseases of Animals to those of Man," which was as follows :

President, Sir Nigel Kingscote, K.C.B., Chairman Board of Governors of Royal Veterinary College.

Vice-Presidents, Professor G. T. Brown, C.B. (Director of Veterinary Department of Board of Agriculture); George Buchanan, M.D., F.R.S. (Medical Officer Local Government Board); E. Klein, M.D., F.R.S. (Lecturer of Physiology at St. Bartholomew's Hospital); Professor James McCall, F.R.C.V.S. (President of the Royal College of Veterinary Surgeons).

Secretaries, W. Duguid, F.R.C.V.S. (Assistant Inspector of Veterinary Department Board of Agriculture); G. Sims Woodhead, M.D., F.R.S.E. (Director Research Laboratory of the Conjoint Board of R.C.P. and R.C.S.); Ernest Clarke (Secretary Royal Agricultural Society).

The PRESIDENT said he should be pleased to hear any remarks with reference to the passing of a grant of money to the International Congress.

Professor AXE said he thought the members of the Council would be pretty well unanimous as to the advisability of making a grant for the object of the forthcoming Congress. It was certainly a most laudable object, and he thought the Royal College should show its interest in it by making a substantial grant towards the expenses which would be incurred. He had great pleasure in proposing that a sum of £50 be contributed by the College towards the expenses of the Congress.

Dr. FLEMING, in seconding the proposition, said he thought that the sum was neither too large nor too small. If the Council would permit him, he should like to allude to the circumstances attending the application. It would be remembered that at the last meeting a great deal of dissatisfaction was expressed at the position of the Royal College with regard to the Congress. In the first place, they had been summoned to consider the advisability of sending representatives to the Congress, but on examining the papers before them, it was found that the College had no *locus standi* at all in the matter. Of course, it was rather astonishing that such an important body as their own should be omitted; and, after the last Council meeting, Professor McCall and himself had seen Mr. Clarke and Dr. Poore, and to their astonishment it was found, according to the books of the Organizing Committee, that an intimation had been sent to the College on the 28th of July last, asking them to appoint representatives, and also that a further application had been made a later date. That, of course, threw them on their beam ends, for it was evident that the Secretary of the Congress had taken care that the College should be included amongst the bodies which were to be represented. He therefore thought, however, the miscarriage of those letters had taken place, that there was no blame attaching to the Organizing body of the Congress, and that the grievance felt at the last meeting did not exist. As evidence of the desire that the College should occupy a proper position at the Congress, a number of the members of the profession had been elected to serve either in the sections or in the general body. He heartily seconded Professor Axe's proposal that a sum of £50 be voted for the purposes of the Congress.

Professor BROWN said he was very glad to hear Dr. Fleming's explanation with regard to the desire on the part of the Committee that the College should be represented. What the difficulty was he did not pretend to know,

but he should like to take the opportunity of making a personal explanation. In the report of the discussion of one of the Council meetings he had seen that one of the members had remarked that it was somewhat unaccountable that, having been appointed quite early in the movement as one of the officers of the Committee, he had neglected to make the Royal College of Veterinary Surgeons aware of the fact. He confessed that he had read those remarks with a feeling akin to profound astonishment, for it was quite beyond his apprehension that any duty of the kind involved upon him, and he in no way considered himself responsible to the Council of the Royal College of Veterinary Surgeons in regard to any appointment which might be offered to him, and which he might choose to accept. If he had thought, or if he could be convinced that it was his duty to inform the Council of any such appointment being accepted or rejected by him, it would be a matter of conscience with him to obey that conviction; but he really did not apprehend that he was in any way called upon to consider himself amenable to the College for any appointment he might accept, nor did he believe that he was in any way charged with the responsibility of keeping the Council informed as to his professional movements. Unfortunately, the members who took part in the discussion to which he referred were not present, and therefore could not enlighten him; but, on the face of it, he thought it necessary to make it perfectly clear that it was from no disrespect to the Council that he had not informed them of his appointment, but from the utter want of conviction that he was in any way called upon to make such a statement to the Council.

Sir HENRY SIMPSON said that he cordially approved of the College joining such an important Congress, and supporting it fairly with its purse. He should like to be satisfied as to whether they were really doing the right thing in voting £50, and whether it should not be £100. Before deciding upon the sum, it might be possible to ascertain what other scientific bodies had given, for it would be better to err on the side of liberality rather than to do anything shabbily. They all knew that Professors McCall, Brown, and Duguid were concerned in the Congress, but he thought the profession would like to know what other members, if any, were associated with it. He was glad to hear that an invitation had been sent to the College, though it had not been received; and it had occurred to him that perhaps the Secretary might be able to find out when the invitations were sent out, and how they had not been received in due course. It was a very serious thing, and might happen again.

Dr. FLEMING said he wished to explain to Professor Brown and to the meeting why his name had been mentioned. They had necessarily felt themselves rather hurt that the college should have been omitted; but on looking over the list of societies and bodies who had been invited to send delegates, it was impossible to arrive at any other conclusion than that a grave oversight had been made in leaving out the College, for, quite apart from medicine, nearly every section of science and pretty well every branch of art had received invitations. On looking over the list of officials Professor Brown's name was found on the Organising Committee, which was the really responsible body for sending out the invitations. The remark was then made:—"Professor Brown is on the Organising Committee; it is rather strange that our College should be left out." He did not think that there was any disrespectful allusion to, or any desire to find fault with, Professor Brown in the matter; but merely a feeling of surprise that the College should be left out considering that he was on the Organising Committee, and also vice-president of one of the sections. With regard to the amount subscribed by other bodies, he might mention that he had spoken to Mr. Clarke on the subject, who had mentioned £50 as sufficient.

Professor BROWN said that as a member of the Organising Committee, if he had attended one of its meetings he should certainly have made a point

of speaking of any omission of the kind had it occurred; but he had been told by the Secretary of the Royal Agricultural Society that it had been arranged to call upon the Royal College of Veterinary Surgeons to send delegates. Knowing that, he could not in the least understand why he should have been expected to intimate to the Council the fact of his appointment.

The SECRETARY said that at the previous meeting it was ordered by the Vice-chairman, the solicitor and himself should wait upon the secretaries of the International Congress. They had been received with every courtesy, and it was explained that it was quite an omission. The office-book was produced with the list of names to which formal letters were ordered to be sent, and in that list appeared the Royal Veterinary College and the Royal College of Veterinary Surgeons. He told the Secretaries that he had received no circular, nor had one been received at Camden Town; had it been sent he should have been sure to receive it. He asked the Secretaries to write a letter to that effect, and he had received the letter now read to the Council, again asking for delegates to be appointed.

Mr. TRIGGER said there appeared to be no evidence as to where the letter was lost, but there seemed to be some evidence that the letters were posted.

The SECRETARY said that there was evidence that the College was on the list of bodies to whom circulars were to be sent, but there was no proof that the circular was posted.

Dr. FLEMING said he was sure that there had been no intention of leaving the College out.

Professor PRITCHARD said he had great pleasure in supporting the proposition that £50 be voted to the purposes of the Congress.

The SECRETARY said that it was also ordered at the last meeting that he should write to the President, asking him to nominate a delegate in connection with himself, and he had nominated Professor Axe.

Dr. FLEMING said that he was on the Section of Animal Diseases, and he had been asked to write a paper for discussion on the subject. Every member of the Congress was supposed to make a private donation, which would entitle him to attend and take part in the discussions.

Sir HENRY SIMPSON said it was very satisfactory to know that the profession was so well represented.

The motion that a sum of £50 be granted to the International Congress of Hygiene and Demography was then put and carried unanimously.

A vote of thanks was passed to the Chairman, and the Council adjourned.

THE CENTRAL VETERINARY MEDICAL SOCIETY.

THE Ordinary General Meeting of this Society was held at the First Avenue Hotel, London, on February 5th.

Mr. F. G. SAMSON (the President) was in the chair, and there were present thirty Fellows of the Society, and visitors.

Letters were read from Mr. J. B. Martin, of Rochester, Mr. Prudames, and the Honorary Treasurer.

Mr. J. W. Evans, A.V.D., and Mr. F. C. Mahon, M.R.C.V.S., of Tufnell Park, London, were nominated for Fellowship of the Society.

Professor SHAVE proposed that a letter of condolence should be sent by the Society to the widow of the late Professor Steele, expressing the sympathy of the whole of the Fellows with her, in her sad bereavement. Professor PRITCHARD, who had been a colleague of the late Professor, seconded the proposition, which was further supported by Mr. F. Raymond, A.V.D., a fellow officer, and by Mr. Henry Edgar, a late pupil of the deceased Professor, and was unanimously carried, and the Honorary Secretary was instructed to write accordingly.

Morbid specimens were exhibited as follows :—

By Mr. HENRY EDGAR—(1) a cystic calculus found in the abdominal cavity of a Sussex spaniel bitch; *post-mortem* showed a rupture of the walls of the bladder; although the calculus was so large it apparently caused but little inconvenience until shortly before the animal's death, the only symptom noted by the persons in charge being that she micturated frequently. (2) A thrombus, taken from the heart of a dog, which dropped dead when excited, having been previously, so far as was apparent, in perfect health. (3) Section of a melanotic tumour taken from the shoulder of a white heifer; the growth measured 9½ inches by 4¾ inches, and weighed between three and four pounds. Mr. Edgar pointed out that melanosis seemed rare in cattle, this was the first case which he had seen.

Mr. EDGAR also exhibited an enormous ring-bone, and the lower jaw of a horse having an abnormal number of incisor teeth.

Mr. REDDISH showed the brain of a horse having a large tumour in connection with the choroid plexus of each ventricle. He explained that the horse had been at work up till the previous afternoon (4th instant), when it was drawing a heavy load in a London street, it stopped suddenly and fell to the ground. He (Mr. Reddish) was called, and saw it an hour after, when the pulse was slow, and the animal in a comatose condition. It remained in this state nearly twelve hours, and then died. The horse was seven years old, and had worked well up to yesterday, except that about two months ago, when pulling a heavy load, it stopped suddenly and appeared distressed; but after five minutes' rest was able to resume work.

Professor AXE pointed out that tumours in the brain were of common occurrence in the horse, but rare in all other of the domesticated animals. It had occurred to him that collars offered an impediment to the blood circulation. It was a remarkable fact horses continued for long periods of time to work, and to show perhaps little or no phyisological disturbance, notwithstanding that tumours of considerable dimensions were contained within the ventricles of the brain. He thought this was perhaps due to the slowness of their growth, and to the fact that the brain accommodated itself to the altered conditions which were imposed upon it. The question of clinical interest was that which appertained to the suddenness of the onset, and to its immediate destructive character. One was disposed to ask why did the horse die so suddenly? Was it due to a supreme effort to draw the load, or to a tight collar bearing upon the venous circulation of the neck with undue force? The comparative effect of these tumours and of very small lesions in the brain sometimes startled them in cases where horses had suffered from "megrims," the only lesion he had found on careful *post-mortem* examination was a slightly congested spot on the floor of the fourth ventricle, this minute lesion necessitating the destruction of the animals.

Mr. RAYMOND could not reconcile the statement that the horse had shown no indications of the existence of such a large tumour, with his own experience of such cases; the probability was that symptoms were present, but that they had been overlooked by the man in charge. In one case, that of an army horse, mental aberration was shown.

Mr. RAYMOND proposed and Professor SHAVE seconded a vote of thanks to Messrs. Edgar and Reddish for exhibiting these morbid specimens, which was carried with acclamation.

The President then called upon Mr. HUNTING for his address on "The Value of Position and Action as Indicating Lameness," which was well received at its conclusion.

ON THE VALUE OF ACTION AND POSITION AS INDICATIONS OF LAMENESS.

Mr. PRESIDENT and GENTLEMEN :—We diagnose lameness in horses by the *position* in which the animal stands, by the peculiarities of *action* when it

moves, and by the more definite and localised changes in the limbs, such as enlargements, depressions, displacements, or it may be by changes of temperature or sensibility. Concerning all these latter conditions which are so valuable as indicating the seat of lameness I have nothing to say. I propose to-night to draw your attention only to the first two indications—the position and action of limbs in lameness. I do so because these two subjects are quite sufficient for one meeting, and because I think they are the most difficult to understand and value. I have nothing new to say, no discovery to unfold, but I may perhaps question some old teachings. I shall attempt to present the subject in a light which may be suggestive; and I hope to extract from your collective experiences any observations which may enable us to more correctly value these two indications of lameness.

We may allow that there is a normal position in which horses stand at rest; also that there is during locomotion a certain sequence in the movement of the limbs, a bilateral symmetry in the motion of each pair of limbs, and a tolerably definite motion of every segment of each individual leg. Departure from these recognised methods of standing or moving are abnormal. Abnormal movement of limbs I call lameness, but abnormal position whilst the animal is at rest may not indicate lameness although it often does so, and is always suggestive. I do not offer this attempted definition of normal and abnormal action as positive and absolute, but simply as a practical standard which will enable me to take a definite stand point. There are, of course, forms of action which are very defective, but which are not lameness; these must be left to each individual to recognise and value when he sees them.

The most common cause of alteration in position or action of a limb is undoubtedly pain; and the abnormal position or action which indicates lameness is due to the animal placing or moving the limb in the way causing least pain. If a muscle be the seat of pain its action will be altered—the degree of alteration varying from the slightest impairment to complete inaction. If a joint be the seat of pain, its motion will be limited. If the bones which support weight, or the foot which comes in contact with the ground be the seat of pain—relief is attempted by declining to support the weight of the body on that leg. It would seem at first sight that, to a man who thoroughly understood the structure and functions of every part of a horse's leg, each alteration of position or action should indicate the seat of pain and perhaps the nature of the lameness. Unfortunately this is only partially true, for no part of a limb has an action independent of all other parts. No joint can be limited in motion without affecting other joints. No muscle can act erratically, or neglect to act, without interfering with or modifying the action of other muscles. Pain caused by attempting to sustain weight on an injured leg causes nearly the same alterations of position or action whether it be in the middle of the column or at either end—whether for instance it be in the hip, the hock, or the foot.

Another cause of abnormal position or action is loss of power in some part of the limb. Loss of power may be due to paralysis of muscle or it may be due to a break in the connection of some structures, such as tendon or ligament, which are necessary to motion.

Still another set of causes may interfere with the action and position of a limb. Anchylosis of a joint prevents its movement completely. Dislocation of a bone sometimes prevents all motion of the affected joint and sometimes permits quite abnormal freedom of motion.

Even this short general statement of the causes which produce peculiarities in the position and action of lame horses is sufficient to show that we have before us a very common complex subject. Different causes may give rise to apparently the same abnormal results; for instance, the toe is dragged when a horse has a stiff knee, and the same indication is noticeable when sprain of a shoulder-muscle is the cause. In other cases the same cause

may produce apparently different indications; thus pain in the foot sometimes causes a horse to go on his toe, sometimes on his heel.

It may perhaps be well if I shortly give a little separate consideration to the two conditions I offer specially for your discussion, and then we can more clearly proceed with their practical application to lameness resulting from injury or disease in the various regions of a limb.

Position.—A great deal is indicated by the position assumed by a horse at rest. Practically the normal position is for the four feet to be so placed as to form a rectangle—the front feet are parallel with each other, and so are the hind. From elbow to foot and from hock to foot the legs forms a vertical line with the exception of the normal obliquity of the fetlock. Above the elbow both fore quarters present the same contour, and the elbow and shoulder joints are on both sides at the same level. Above the hocks the hind quarters should show a perfectly symmetrical outline on both sides. Numerous are the possible departures from this normal position—sometimes they affect a pair of legs, sometimes only one. Not always is the most prominent alteration directly indicative of the affected leg. When acute pain affects both fore feet the most pronounced alteration of position is in the hind feet which are brought abnormally forward—as in Laminitis. Sometimes we find the vertical line of the fore legs much altered—the knee being thrown forward so that the shank bone forms a considerable angle with the radius. This condition may be accompanied by lameness, but often it is not, but it is nearly always indicative of tenderness in the feet or, it may be, of a previous foot lameness. When a peculiar position affects only one leg, it is generally a sign of lameness. The whole limb may hang in a pendulous condition, or it may be "carried" so that the foot never touches the ground. The whole leg may be advanced so that the foot is placed some distance in front of its normal resting-place, or it may be retracted so that the foot is behind its normal position. A fore leg may be advanced with the *knee straight* and the foot level on the ground. It may be advanced with the *knee bent* and the foot level on the ground—a position impossible if the parts above the elbow are doing their normal duty. A very common position accompanying lameness is when the toe touches the ground but the heel is raised. This obtains when from any cause the animal wishes to relax the flexor muscles, or when it does not wish to sustain the weight of the body upon the limb. Another common defect in the position of the leg is brought about by an abnormal relation of the pastern to the shank, which in its most aggravated form is called "a shot fetlock." It is most common in the hind limb, and very often unaccompanied by any disease of the joint. It appears to be due in some cases—often noticeable in conjunction with Spavin—to the way in which the hock and fetlock joints are forced to co-ordinate their movements by means of connecting tendons and ligaments.

A horse at normal rest has no muscles quite inactive—there is always sufficient contractility displayed to keep their tendons taut. If we notice absolute relaxation we have a condition which is just as indicative of disease as is violent contraction. Twitching of muscle is a symptom, too, which should not be overlooked. In the regions of the shoulder and hip it is a valuable indication of fracture of bone in the early stages when little displacement has occurred, and crepitus cannot always be felt. It appears to be due to the irritation of the muscle in contact with the edges of the fracture.

Perhaps the most puzzling thing about the position of the limb in relation to lameness is the very common fact that a horse may show great lameness when moved, and yet at rest give no indication whatever of pain or injury by an abnormal position of the limb.

Action. When a horse is moved over in the stall he sometimes gives indications of lameness which are quite as pronounced as any which can afterwards be adduced by more deliberate movements. In some cases of hock disease

we notice a jerky, string-halty motion of the leg when the horse is moved over in the stall, and yet when he is run out very little defect is noticeable. In some cases of "shivering" too, we notice the movement of the tail more evidently in the stall than by any amount of motion afterwards.

The first few steps in some cases of lameness are more indicative than any prolonged exhibition of action. In cases of navicular disease affecting the front feet, and of spavin affecting the hind limb this is very noticeable. After progressing a few yards, especially if excited, the defect in the action disappears. This I take to be evidence of joint disease in practically nearly every case. The peculiarities of action displayed by lame horses are many. We may have the whole limb "carried" with the foot off the ground; we may have it "dropped" and the toe dragged; we may have it brought forward with a jerk, or carried outwards so that the foot describes a segment of a circle; we may have a difficulty shown in bringing it forward, and we may see a positive inability to advance it; the step may be too short or too long; there may be evidence that the alteration of action is due to inability to sustain weight when the foot reaches the ground, or it may be that the difficulty is most noticeable in attempting to raise the limb. Sometimes we derive information by the difference manifested at different paces. A horse walks out sound but goes very lame at a trot. In the fore leg, I believe this is indicative of splint lameness, and the inference is that the impact of the foot on the ground being more violent at a trot than at a walk gives rise to greater pain. In the hind limb I think I have observed in hock lameness that much greater evidence of pain is seen at a trot than at a gallop. and I explain it by the fact that in galloping a horse's hind leg has the greatest movement from the hip, whereas in trotting we find the most extreme flexion at the hock.

When both fore or both hind limbs suffer from the same painful condition the peculiarity of action is much disguised, and lameness is not so clearly indicated. As a rule such cases suggest the foot as the seat of lameness.

If a joint be seriously diseased, there is naturally an attempt on the part of the animal to use that joint as little as possible, and motion is limited to the narrowest degree within the power of the horse. Sometimes the joint is, by bony deposit, mechanically hindered from full extension or flexion. Even in these cases we are not always able to diagnose the case by action alone, because there are joints which can only move in unison with other joints, and therefore the defective motion equally affects two or more articulations. In the hind leg hock and stifle can only act together; in the foreleg a stiff elbow joint may prevent flexion of the knee.

Single muscles or groups of muscles may be defective or deficient in action, and then we have very curious movements of the limb or portions of the limb. The crural muscles sometimes atrophy, and difficulty is then apparent in bringing the leg forward. Injury to the flexor metatarsi gives rise to very diagnostic symptoms. Injury to the triceps extensor brachii also causes very striking alteration in action. The difficulty of valuing correctly the indications caused by defective action of muscles depends upon the effects produced on other muscles, and also upon the fact that very different lesions may give rise to very similar alterations of position and action of a limb. The movements of a leg during progression are very complex. The limb is advanced by the co-ordinate contraction of both flexors and extensors. When one of these fails to act some control is lost over muscles which are apparently antagonistic, but really auxiliary. So long as all work together automatically rhythmic action results. When one ceases to act, or acts erratically, then others which were normally complementary become antagonistic, and very strange motions result.

In no case is this better marked than in injury to the flexor metatarsi. During health this muscle and the gastrocnemius work harmoniously, and the leg below the hock is rhythmically flexed and extended. But these are not

all the muscles acting upon this part of the leg—there are the extensors and flexors of the foot, and the muscles of the thigh. When the flexor metatarsi is inactive, or only partiallyactive, and the horse is forced to move forward the large muscles of the upper portion of the limb act as usual in raising the leg and bringing forward the stifle, the extensors of the foot also act, and probably the flexor metatarsi commences to act, but is compelled by pain to desist immediately. The consequence is that the flexors at the back of the leg acting upon the os calcis, having lost their counter-balancing action cause the foot and metatarsus to be violently thrown backwards and upwards to such a degree as to relax the tendon of the gastrocnemius, which is seen to form a loose fold, and thus offer a diagnostic indication of the seat and nature of the lameness.

(*To be continued.*)

LINCOLNSHIRE VETERINARY MEDICAL ASSOCIATION.

A MEETING of the Society was held at the Angel and Royal Hotel, Grantham, on February 19th. President, F. L. Gooch, Esq., F.R.C.V.S., took the chair, and there were present Prof. Penberthy, Capt. Russell (Treasurer), Messrs. F. W. Wragg, R. T. Hardy, W. H. Brooks, W. Dickinson, F. W. Reeks, J. H. Goodall, R. W. Clarke, C. Hartley, J. Mackinder, Jas. Smith (Hon. Sec.), and E. Morgan and Thompson (Visitors). Letters of apology were read from Dr. Fleming, Professors Pritchard and Walley, Mr. Greaves, Mr. Freer, and others.

Representation of the Council.

The minutes of the last meeting having been taken as read, Capt. RUSSELL said before they went on with the next matter he should like to remind them that there was one matter which they had omitted. As this was their annual meeting, it was their duty to select a member of the Association as a member for Council for the year. He believed there was nobody in Lincolnshire sufficiently ambitious to undertake such duties in the Council chamber, and therefore he would have great pleasure in recommending to their notice the name of a gentleman which they would receive with gratification. He belonged to a great number of their Veterinary Medical Associations and was at the present moment treasurer of the Royal College of Veterinary Surgeons. Whatever he did he did with all his heart, and he had great pleasure in recommending this Association to take him up at the next election. He proposed that Mr. Wragg be adopted by this Association.

Mr. MACKINDER seconded, and said he believed every member of the profession would give him a vote. He was sure Mr. Wragg was perfectly safe. Eventually it was resolved that the Association would support three gentlemen, namely, Professors Pritchard, Axe, and Mr. Wragg. This was adopted unanimously.

Capt. RUSSELL read the statement of the accounts, which showed a balance in hand of £18 18s., and intimated that this would be much larger if all subscriptions were paid in. He had received a letter from Mr. Smith, of Market Rasen, stating that he had forwarded the head of a calf as a pathological specimen.

Mr. WRAGG said he should commence the few observations he intended to make by thanking his friend Capt. Russell for the very kind way in which he had spoken of him and introduced his name to them. He did not know whether they wished him to say a few words on the burning questions of the day; if so, he should be pleased to do so. He could, however, only reiterate what he had said at Birmingham the other day. It appeared to him

there were three questions upon which they were told by their veterinary journals that members would be elected to the Council Board, and the first was, Is a New Charter Requisite? and another was, Is the abolition of the 9th Clause necessary? and the third was, Elicit the opinions of members who were candidates as to the Dual Appointment. As to the new charter he certainly thought there some reforms which could be very well introduced, and he was entirely in favour of a new charter, and the other day he voted in the majority that declared that a new charter was requisite. As to the abolition of the 9th Clause, he told them candidly he was entirely against that clause being abolished, for this reason: He thought, firstly, it was a retrograde movement, and the time for discussing that matter was past. Any opposition there was should have taken place when the new charter was obtained in 1876, and not come from the members of the profession who had joined since then. It might press hardly upon those who were members before, but they had the opportunity of taking the fellowship degree, and he thought every member of the profession was, or should be, capable of taking that degree. When the first agitation sprung up, he made up his mind to take the fellowship degree, and every member who had the profession at heart should take that degree.

With regard to the dual appointment, they had several good men on their Council who were also Examiners. He might mention Dr. Fleming and Professor Pritchard. Were they going to turn them off the Council? He said "no," he would not raise his voice to turn them off the Council. They had been on the Council many years, and they knew the requirements of the profession. He only mentioned these two, but he might include Mr. Cox and other gentlemen who had always studied the best interests of the profession, and would continue to do all they could to promote its welfare.

Anæsthetics.

Prof. Penberthy, who was received with applause, said when he was invited to address this meeting he accepted on the condition that the subject should be chosen for him. When one wandered about giving papers it was better that the subject should be one best adapted to the requirements of the members of the Association. It was quite impossible for him, in London, to know what would suit a certain district or a certain association. On this occasion if he had not consulted their president and secretary he should have been obliged to make some remarks upon a subject which was before their Association last time. After some little consideration, some weeks ago he submitted a few subjects, and one was selected upon which their secretary said they would be glad to have a few remarks. He had not had time to prepare a paper, but he had a few remarks for which he must ask their consideration for the rambling condition in which they must necessarily be given, for the subject was a broad one. It had two sides, a scientific and a practical one. It was first with some practical aspects he should have to deal, without attempting to go at any depth into the scientific side. He need trouble them with but few remarks as to the history of anæsthetics, as they had been used from time immemorial. History told them that in ancient times the Chinese recognised their use, and 1,500 years ago mandrakes were used for this purpose, they were used for producing loss of sensation for the purpose of operations. He need not go back as far as the Bible, though the prophet Amos, 700 years B.C., spoke of wine producing sleep. In Romeo and Juliet draughts were given removing mental, if not physical pain, but it was only during the last fifty years that anæsthesia was adopted for surgical purposes. In 1830 Sir Humphry Davy discovered nitrous-oxide gas, and in 1845 an American applied this to surgical practice. In 1845 Horace Wells adopted it generally in surgical practice in England, and it was also associated with

the name of Sir Jas. Simpson in 1847. It was impossible to calculate what benefit would be conferred upon animal life by applying anæsthetics to the practice of veterinary surgery. Their daily bread was of course their first consideration, but if they wanted to make their lives thoroughly happy, they might go beyond the mere accumulation of money, and yet have a fair subsistence with his pleasure, and the greatest pain might be saved to the sentimental. There was no doubt the lower animals were not so susceptible to great shocks as the human being. Still, there was plenty of evidence that they suffered great pain, and were seriously affected by that suffering. The greatest advantages were claimed for the use of anæsthetics, as lessening pain to the lower animals, and they (veterinary surgeons) were able to perform operations more calmly and in better form than they did without them, and there was also less risk to them as individuals. These great advantages were quite sufficient to put forward in order to encourage the use of anæsthetics.

An anæsthetic was something which destroyed all sensation. It went beyond an anodyne which did not interfere with the reflex action so much. Anything which destroyed sensation totally destroyed the reflex action. Anæsthetics might be divided into two, local and general. The local anæsthetics were, in their practice, as useful as general anæsthetics.

Ether spray removed sensation by rendering the part extremely frigid, and many of their minor, and some of their larger operations could be performed with ether. It withdrew the latent heat, and they found that the part was absolutely insensitive. There was a great objection to it, however, and that was the loss of vitality which the part suffered from it. There was a great deal of pain during the time it was applied and after the part returned to its normal state.

He held that a more useful anæsthetic was cocaine, and ever since that had been used it was recognised that it rendered patients unsusceptible to the pain of operations. Cocaine removed pain from large surfaces locally, and he had operated with it for removing very large tumours. He had removed 17 lbs. of tumour in twenty-five minutes under the influence of cocaine, with the horse standing, without a twitch or secured in any way whatever. Cocaine was used in a five per cent. solution, and a horse would stand a dram, though he had tried two drams without poisonous effect. He was afraid what they obtained commercially was a most impure article, and consequently they could not place reliance upon it. He regarded it as the most useful anæsthetic in veterinary practice. In certain forms it did not keep well in water—tabloid form excepted, but if they mixed a few drops of camphor water with it, it would keep an indefinite period. With dogs it was said to cause a certain amount of mortality, but he had never seen the slightest hurt from it, but an assistant of his gave a dog a dram of the five per cent. solution, and as they would expect it was followed by death. He had a letter from an old student last week, saying he had thirty-three operations in dogs, and he gave twenty drops of cocaine of the five per cent. solution. If his observations were correct, he did not think that he wanted to see more than this commended to their notice. They all knew well the effects on the mucous membranes, and how they could examine the eye in a perfect manner. This was generally difficult to examine, and he could not help thinking that this drug, cocaine, was extremely useful.

They knew very well that an animal could be reduced to a state of anæsthesia by administering pure carbolic acid. This was a perfect local anæsthetic.

As regarded a general anæsthetic, when loss of sensation was produced, either ether, nitrous oxide (laughing gas), or chloroform was generally adopted. If he dealt with chloroform, he should perhaps meet their wishes best.

He reminded them that when a man had an interest in his daily work, his life was worth living. They had first to count the cost, and he should state that methylated chloroform answered the purpose as well as pure chloroform, if they could judge from the human subject, although it produced a little more nausea. He was told by many practitioners that the administration of chloroform was a source of increase of income to them, but he did not know how it applied to them. That was they could charge fees for the administration of chloroform which were quite adequate, the expense he was sure they would not allow to be of the slightest consideration. Any one who had an animal of great value who could be shown that it would not suffer if operated on under chloroform, that the chances of recovery would not be less but greater, they would have no difficulty in getting their clients to adopt it, and again where sentiment came in, there would be less trouble. The Professor then produced a certain instrument which had been manufactured for the purpose of anæsthising foals and pigs when they were very troublesome. Anæsthetics might be useful, but he thought that the effects produced by ether and the nausea following it would be fifty times greater than the pain produced by the operation. He did not believe in that instrument at all, though it showed them they could introduce anæsthetics into the system per rectum. They had also been taught that to get the fumes of tobacco into the system was most useful, and thus they produced narcosis, but he was afraid they would not think it was worth while to apply that operation to colts and pigs. When they came to consider the use of chloroform in the ordinary way, he held they would adopt it more than they did at present; then subjects might be with safety rendered fit for operations by chloroform. Nothing had been said about the danger of giving chloroform to the horse, though there had been much said about the danger of giving it to the dog. He could say that he had never had an accident with a horse, though in the course of his profession he had seen one horse die which was absolutely poisoned by chloroform. He had twelve ounces, when he (the Professor) only supposed he had had twelve drachms. In another case he could not kill an old horse with chloroform, although he was known to be suffering from heart disease. Thus, so far as horses went, they could not consider the danger of giving chloroform, if it were only given properly. In the dogs he had never had an accident, and he believed that the accidents had followed through the administration of chloroform occurred because people were too careful in giving it, and did not give sufficient before they commenced the operation. Anæsthesia could only be brought about by robbing the brain of its blood, and preventing the oxydation of its cells, or by bringing the blood into such a condition that it did not become oxygenated. They knew very well that they had nightmare sometimes, and that they saw certain things under certain conditions when part of the brain might be in a state of anæsthesia through sleep. They sometimes might be alive to the fact that a lion was coming, though the other part of the brain might be in a deep anæsthetic state of sleep. This was a rather useful fact for them to recognise. It was necessary they should understand that the brain should be equally under the influence of chloroform. They had heard of death of animals under chloroform, and he had seen an animal die immediately, as soon as ever the knife was drawn across the animal collapsed. Chloroform, unlike ether, left the heart centre till last before it paralysed. If the vaso-motor was under the control of chloroform, and not capable of being stimulated, then the animal died from sudden stoppage of the heart. This was what they were liable to if they did not give chloroform sufficiently, and get the whole of the centres immediately under its effect. The local anæsthetics had different effects according to certain degrees of action. They were all stimulants, and then

depressed into that state which they called narcosis, in which reflex action was lost. In some cases pain would be felt, and there would be sufficient sensation just to allow of the moving of the limbs. That was a fact that would affect their operations, because they could not keep the animal steady. With others the spinal cord and brain became attacked, and then came on paralysis. A great deal depended on the amount of chloroform given, but there was not much hope of recovery if paralysis set in for any length of time. When administering chloroform, it must be remembered that it was very likely to stimulate the nerves on the top of the throat, and cause a spasm of the glottis or a falling down of the epiglottis. These symptoms were very alarming, and the animal began to gulp and put itself into a position for vomiting. In this condition they should remove the chloroform, and so on as before, allowing the animal plenty of fresh air. The amount of chloroform that should be mixed with the air should be about five per cent., but by experience in these matters they might even go as far as twenty-five or thirty per cent. It was claimed that some of the agents produced asphyxia at the same time with anæsthesia. That was sometimes the effect with chloroform. It was to him a scientific as well as a practical reason for not giving chloroform standing. Some people put on one of Carlyle's muzzles, and let the animal play about until it fell down. He was convinced it was not the best way to chloroform the horse standing, as, if they made up their minds from the first, they could throw the animal without any extra difficulty. When the animal was getting in a proper state of chloroform they had to pay regard to it. If the pulse was weak and still, there might be a certain amount of danger, but the only fact they had to look at was, not whether it be fast or slow, but whether it be deep or shallow. They had observed a great difference between the pupil of the human subject and that of the horse. In the human subject the pupil was contracted, and that was taken as a guide, but he had never seen one per cent. of horses where the pupil was contracted. In the human subject, if dilatation set in, it was thought an extremely dangerous symptom. He had noticed in horses that when perfect anæsthesia set in, their pupils were not in a state of dilatation, but rather of contraction, so that they could take that as a guide. If they should have the mishap to get an animal into a state of paralysis after giving chloroform, they should never desist from making efforts at resuscitation, at least for a very long time. He had seen a horse said to be dead resuscitated in the most perfect manner within forty minutes. In one case he well remembered, by artificial respiration and by giving stimulants, the animal was got round to its normal condition within forty or fifty minutes. If he were in practice, he should use nitrate of amyl as an extremely useful stimulant. It was an extremely pungent and most powerful stimulant of the heart, and the best thing that could possibly be used. He thought that they, as members of their profession, were bound to advise the use of anæsthetics. Of course they should not do more than advise. There were many people who had never heard of the use of chloroform to animals, but not only in surgical operations, such as the removal of tumours, but in spasmodic conditions, and in parturition it had been used with good effect, though they must remember that they would not get the help from the mother, as it prevented the contraction of the uterus and the assistance of the abdominal muscles, though it was useful in cases of straining. Lots of practitioners always fired their horses under chloroform, and he knew one man who always got two guineas more for its administration when firing the legs. They would all agree with him that it was advisable to recommend the use of anæsthetics in certain cases, and it was for them to consider if it were practicable, and if so, to advise its adoption.

He was quite aware of the fact that these remarks were loose and unconnected, but he must plead that he had no time to properly prepare a paper on this subject.

Discussion.

Capt. RUSSELL said, as to the remarks about the action of ether spray, he had had a little experience with it, and he had been given to understand they could not fire horses after its application. They set fire to the skin and burned it, owing to the action of the gas. As to cocaine, he quite agreed that it was a particularly useful agent in veterinary practice, particularly for the examination of a horse's eye. Instead of five per cent., he had given as much as ten per cent of cocaine. As to chloroform, he thought there was a great deal depended upon the manner in which chloroform was administered. He produced a muzzle which he had used for nineteen years, and he never wished to use a better instrument for the administration of chloroform. Another muzzle produced he did not care for, as it was not made large enough. He remembered he once saw Mr. Cox administer chloroform, and he put the horse's jaw into a jack boot and got one nostril blocked with a sponge saturated with chloroform. In this muzzle an ounce or an ounce and an half of chloroform was quite sufficient, and would take about seven or ten or twelve minutes to anæthetise a horse, and he did not find that the other muzzle did them in less time. He once had to poison an old horse with chloroform, and he started with two ounces first, and every quarter of an hour gave another ounce and a half. He gave up to fourteen ounces and the horse was still standing. He finally had twenty-four ounces of chloroform and would not die, so he cut his throat to save him the trouble. Considering this horse had twenty-four ounces they need have no fear of killing a horse with chloroform. To operate upon horses standing, he would never try to give chloroform. He had tried that instrument for administering chloroform per rectum, and his advice was don't use it, as it did not appear to him to anæthetise them in any shape. He had used chloroform with great satisfaction in cases of stoppage of bowels, they could then insert their hand per rectum and remove the dung. In these cases if they put a horse under chloroform let them lie him quietly down on the bed, get him under chloroform, put the hand into the rectum, and they would have a very good result. Another preparation he used was chloral hydrate, and he had had good results. There was one question he should like to ask Professor Penberthy, and that was as regards hæmorrhage. His experience did not extend to this, but he had heard that if they castrated a horse under chloroform, they had a difficulty in suppressing the hæmorrhage. He should like to know what the Professor's experience was in that respect.

Mr. MACKINDER said his experience in anæsthetics was principally with chloroform. He tried Carlyle's mask and gave two ounces. It never acted in the least, and they gave two more, and then some more before they got him under its influence. He thought the after-effects of ether were worse than the pain of the operation, and he certainly should never give ether again. He had been very fortunate in giving it to dogs, and he remembered in one case bringing one round by putting him under the pump. As for using it for all operations, would it pay?

Mr. HARTLEY, after eulogising Carlyle's gag, said as to his experience in rendering dogs insensible he should not use chloroform, though he had seen some good results. He had a funnel-shaped bag which he used for dogs and horses, and he had no difficulty with it. He quite agreed with Captain Russell as to the inflammatory diseases of the bowels. He liked using cocculus indicus, and used very little opium in his practice.

Mr. GOODALL said it was about three years since he saw the first animal chloroformed, and she died—it was a foxhound bitch. That was the only case of death he had seen from chloroform. He seldom fired horses without putting them under chloroform. To his mind the great secret of firing horses

was to have no noise. Let them put blufts on them and let them walk about, and they would stand quite still.

Captain RUSSELL said that might be so with the high-bred horses which Mr. Goodall attended, but he scarcely thought it would do with cart horses.

Mr. WRAGG did not know that he had anything particular to say about anæsthetics. He had used chloroform in several cases, and in one case for taking a horse's molar out—he was so touchy about the mouth that he could not do without it—he also got a piece of another molar, as the horse moved his head, but he remained under the influence of the anæsthetic until after he had extracted the other tooth. He should like to ask Prof. Penberthy, who had introduced the subject, to explain more minutely his method of bringing a horse round when he thought it was going to die from the effects of chloroform.

Mr. HARTLEY said he should like to know the right way of inducing artificial respiration. What movement, and at what rate?

The PRESIDENT (Mr. Gooch) said they were all very much obliged to Prof. Penberthy for his very able address. He had given them many practical hints. There was one point of interest which struck him, it was the four different states of chloroform which he explained. If they judged from these four different stages, it would be one of the greatest guarantees that the animal was in a complete state of anæsthesia. As to performing operations standing, he for one was in favour of firing all horses standing. His father never cast horses for firing, but he did them all with the stocks. He very seldom used chloroform on the larger animals, and complained that in the provinces they come into contact with impure drugs. In cases of parturition, if he had got a mare which was very restless he invariably gave a dose of chloral hydrate. He did not administer it to cattle, as they could better help themselves, but with mares in parturition it would have the greatest beneficial results.

Prof. PENBERTHY said: As to the question of resuscitation, they should get the head low, as it was the first and most important thing to favour the circulation, and by pressure to drive the blood from the bloodvessels of the brain; at the same time get the mouth open. In the first case to which he referred there was spasm of the glottis. Get the tongue out immediately, grasp it, and pull it out, and keep the head low. If they could not get him right then, put the knife into the trachea, and perform tracheotomy. Get the head as low as possible, the mouth open, get the animal on its side, and lift one of the legs, and get a man to put his knee over the heart, and get respiration by lifting the leg as high as they could. As soon as any sensation was obtained, dash cold water or any stimulant on the outside, and about fifteen or twenty times a minute; try to obtain respiration by drawing the fore-limb upwards and pressing the chest, and it will get filled with fresh air. If they should happen to have an accident, let them not give up for a long time. He again recommended nitrate of amyl, which was a stimulant of the heart and its ganglia. Ammonia was apt to irritate the Schniderian membrane. He had asked Captain Russell if he ever had any bad effects from chloral hydrate. He knew chloral was used by veterinary surgeons on the Continent, where they often gave as much as ten ounces, half a grain for every pound of horse. The objection urged to the chloral hydrate was that it dilated the capillaries, and rather favoured hæmorrhage. As to bleeding after chloroform, he had never had the slightest indication of its favouring hæmorrhage, and he did not think it was held to do so by surgeons.

Capt. RUSSELL asked if in an animal under chloroform, the muscles were not in a state of paralysis.

Prof. PENBERTHY: Not paralysis, but anæsthesia.

Capt. RUSSELL: It would be in a state of collapse.

Prof. PENBERTHY: Yes.

Capt. RUSSELL: Therefore it was quite probable that the involuntary muscles would not be so likely to contract.

Prof. PENBERTHY: That the voluntary muscles were more affected than the involuntary. So long as an animal was under chloroform, he should think it would favour hæmorrhage, but he had understood Capt. Russell to refer to the secondary symptoms. If they wanted to save their chloroform, they should first dip their sponge into warm water, and they could save half their chloroform. He was extremely glad to hear that anæsthetics were so generally adopted in the veterinary profession. It was certainly a sign that they were getting on.

Capt. RUSSELL here produced a pathological specimen of a huge anchylosed hock which he had known in life, and from which the animal never went lame; and also the calf's head forwarded by Mr. Smith.

Next Meeting.

It was resolved that the next meeting should be held in June, at Boston, when Mr. Dickinson promised to give a hypnotic seance.

The New President.

Mr. DICKINSON was unanimously elected President for the year, and thanked the members for the honour conferred upon him.

An Honorary Associate.

Prof. PENBERTHY was unanimously elected an honorary associate of the Society, and Mr. JAS. SMITH (Hon. Sec.) proposed a hearty vote of thanks to the Professor for giving them such an interesting and instructive address. He held that nothing tended to improve a society like theirs more than an address of a scientific and practical nature like the one they had that afternoon.

Mr. HARDY, of Sleaford, seconded, and cocurred in the opinion as to its being an address both interesting and instructive.

Prof. PENBERTHY said he was extremely obliged for their thanks, and very pleased to have come amongst them. He had intended to refer to that interesting branch of anæsthetics, hypnotism and mesmerism, and was sure they would enjoy the proposed seance at Boston. He thanked them for receiving him as they had done.

Mr. WRAGG thought they would be wanting in their duty if they did not propose a vote of thanks to Mr. Gooch for the able manner with which he had carried on the duties of his important office.

Mr. DICKINSON seconded, and the proposition having been carried by acclamation,

Mr. GOOCH responded suitably, and expressed his regret at being absent from the last meeting at Lincoln.

The members then dined together, an excellent and *recherché* repast being served by the host of the "Angel and Royal" Hotel.

THE MIDLAND COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE annual meeting of this Association was held at the Great Western Hotel, Birmingham, on February 13th, 1891. The President, Mr. F. W. Wragg, occupied the chair. There were present, Professor Walley, Sir Henry Simpson; Messrs. Barber, Olver, Barling, E. Beddard, T. E. Cartwright, H. D. Pritchard, J. Blakeway, R. Wilson, A. Gibson, Franklin, H. M. Stanley, F. C. Tippey, Butcher, W. Carless, J. R. Carless, H. Collett, H. J. Dawes, Gold, F. L. Gooch, A. Green, T. Chambers, Martin, T. H. Merrick, H. Olver, E.

Paley, Pemberton, Pinkett, W. S. Carless, G. Rossell, Capt. Russell, G. Smith, R. C. Trigger, Warmington, G. Wartnaby, J. Wiggins, H. Barrett, E. G. Crowhurst, W. S. Weighill, F. Blakeway (Treasurer), and J. Malcolm (Hon. Sec.).

Visitors: Dr. Garman (Wednesbury); Dr. Barling (Birmingham); Messrs. J. R. Green (Alfreton), Bakewell, R. Hughes (Oswestry), Gartside Mayor (Kirkham), Scriven (Tadcaster).

The President (Mr. F. W. Wragg) entertained the members present to a sumptuous luncheon at the Great Western Hotel; afterwards the members removed to another room and the meeting commenced.

Professor WALLEY asked permission to make a personal explanation. He said that at the last meeting Dr. Manley made some remarks in reference to his position in connection with the medical officers of health and the inspection of meat. Dr. Manley did not justly represent his position. He (the speaker) advocated the formation of a Sanitary Board, formed of the medical officer of health, the veterinary officer, and the senior inspector of markets and slaughter-houses. The Professor took occasion also to appeal, on behalf of the committee on "black quarter," for the views of members of the profession who had had experience of the disease. He would be very pleased to give his own experience, which, ten or fifteen years ago, was very large.

The PRESIDENT said that Professor Walley's views, or those of any other member of the profession, would be very acceptable.

The SECRETARY read letters of apology from the following gentlemen:—Professors Pritchard, Penberthy, Williams, McFadyean, Axe, Dr. Fleming; Messrs. Kibble, Kenyon, J. M. Axe, Perrins, Tailby, Cartwright, Barling, Coe, Blakeway, Greaves, Hunting, Verney, and others.

Mr. J. R. Green, of Alfreton, Mr. J. Brett, of Nottingham, and Mr. J. C. Martin, Chesterfield, were nominated as new members.

On the motion of the SECRETARY, seconded by Mr. Olver, H. Barrett, of Nuneaton, was elected a member. On the motion of the SECRETARY, seconded by the PRESIDENT, Mr. Crowhurst, of Leamington, was also elected. Capt. RUSSELL moved the election of Dr. Manley as an honorary associate, and referred in gratulatory terms to the paper lately read by that gentleman. Mr. WIGGINS seconded the proposition, which was cordially agreed to.

The PRESIDENT, in accordance with what he termed an unwritten law, submitted the name of his successor in office, the name of a gentleman who, he said, had done a great deal for that Association as its Secretary—his friend Mr. Malcolm. Mr. Malcolm would carry out the duties of President in the earnest manner in which he had always acted in promotion of its interests.

The TREASURER (Mr. Blakeway) seconded the nomination, with pleasure, but with some reluctance. It would be very difficult to find a Secretary who would do the work so admirably and so successfully as Mr. Malcolm had done it. He did not know a man whom he would have greater confidence in putting in any office, and his only regret was that they could not make him president without losing him from the secretaryship.

Capt. RUSSELL: Whom are we going to have as secretary?

The TREASURER: I daresay Mr. Malcolm can introduce to us a good man.

The PRESIDENT: I have no doubt of it.

The resolution was agreed to amid hearty applause, and Mr. MALCOLM, in reply, thanked his friends for their kind words and the great honour they had conferred. It had been a great pleasure to him to do the secretarial work, for every member he had had the least connection with had seemed ready to assist him. The responsibilities of the presidency he full appreciated. The Midland Society was either the oldest, or one of the oldest, Veterinary Societies in the Kingdom; it was one of the largest, and it was also one of the wealthiest. Men who held the very highest positions in the profession

had occupied the presidential chair; and his diffidence in consenting to follow them was only overcome by the knowledge that he would have the assistance of their past president, their vice-presidents and, he believed, of every member.

Mr. Dawes, of West Bromwich, was elected Secretary, on the nomination of Mr. MALCOLM, seconded by Mr. TRIGGER. The re-election of Mr. Blakeway, whom Mr. Trigger called "our perpetual treasurer," was agreed to very heartily on Mr. TRIGGER'S motion, seconded by Mr. CARTER and supported by Mr. WIGGINS.

Mr. TRIGGER proposed, and Mr. BARLING seconded, the election of Mr. Wartnaby as a vice-president.

Mr. BEDDARD proposed, and Mr. DAWES seconded, Mr. John Blakeway.

Mr. CHAMBERS submitted the name of Mr. George Smith, reminding the members that Mr. Smith had been a member of the Association from twelve to fourteen years, and one of the most regular attendants at its meetings. Mr. WIGGINS seconded the motion.

Mr. John Blakeway withdrew, and Messrs. Wartnaby and Smith were elected.

Mr. HARRY OLVER moved the election of the retiring President as a candidate for Council. He said that Mr. Wragg retired as a member of Council this year, after filling that position with credit to himself and advantage to the profession. He was the treasurer of the College, and as such must be known to his co-councillors as an exceptionally good man. He was the treasurer also of the National Veterinary Association, and he had many other things to recommend him.

The TREASURER, in seconding the resolution, said that he, as a member of Council for many years, had known Mr. Wragg at the Council Chamber, and he could assure them that no more independent man sat there. Mr. Wragg had always been actuated by a full determination to vote for those measures which he believed would be most consistent and advantageous, and he had pinned his judgment to no man.

Mr. WIGGINS was proud to have the opportunity of voting for Mr. Wragg, who was a man particularly pre-eminent, and a man not ashamed of being found alone in a good cause.

Mr. TRIGGER also supported the motion, on the ground that Mr. Wragg was the most earnest, indefatigable worker on the Council, which could not afford to lose him.

Mr. JOHN BLAKEWAY: Would Mr. Wragg give his opinion on the three burning questions of the day?

The PRESIDENT, before replying, asked the Secretary to read the following letters:—

"DEAR MR. SECRETARY,—Attendance at a law court here will prevent me availing myself of the pleasure of hearing Professor Walley's paper and taking part in your discussions.

"I notice on the Agenda, a subject which I should much have liked to take part in—I refer to 'Nomination of Candidates for Council.' May I ask you to remind your members that this election may be a turning point in the progress of our profession, and that it should be approached with more than usual caution. I anticipate that the Midland Society may nominate as their President Mr. Wragg, who is one of the candidates this year.* If I were present I should vote for him, but much as I respect him and value his friendship, I should refuse to do so unless he gave clear expression to his views on the most important professional topics. Whether I believe a candidate agrees

* This was written under a misapprehension. The writer had been told that Mr. Wragg was willing to vote for two of the "three points."

with me or not, I intend in future to vote only for men who trust their profession sufficiently to let their views on important questions be clearly known. I think this matter of sufficient importance to ask you and your Society to resolve (no matter who your nominee may be) only to vote for him on his clearly stating his views. "WILLIAM HUNTING."

"MY DEAR SIR,—Your circular to hand, and if I am able shall be with you, but at present, and for the last five or six weeks, I am invalided, out of collar, and may not be able to get to the meeting. Be that as it may, I wish you a good meeting and an interesting discussion.

"At the Lancashire meeting, last Friday, I ran up from here to attend, and I proposed Mr. W. Whittle as our candidate for council; Mr. P. Taylor seconded, and it was carried unanimously. I advised that our association should work in conjunction with Midland and Yorkshire. His views will be forthcoming. I believe he is in favour of a new charter, annul clause IX, and no dual appointment. With every good wish,

"Mr. John Malcolm. THOS. GREAVES."

The PRESIDENT said that not being a Midland Counties man, he felt very grateful to his friends for the great confidence they had reposed in him by proposing his name. He had been on the council for ten years, and had always tried to vote for what he thought the best interests of the profession, fearless of anybody's *pro* or *con*. He thought he knew something about the profession, for he had belonged to it nearly thirty years; but he was asked by a certain gentleman to give his views. He did not fear to express his opinions publicly. The ninth clause was adopted in 1876, and he rather thought that the opposition to that clause should have been urged then. He must own that the clause bore very hardly on members who had been in the profession previously to 1876. It bore very hardly on him, for he had been a member of the profession for over fifteen years, and he tried to think what he had done to the profession that he should not have been made what was called a "foundation fellow." However, he accepted what was done at the time and he would be sorry to complain now. As regarded the dual appointment question, there were a great many men now who were members of Council and Examiners, and the great question with him was whether those members of the Council who were Examiners could be spared from the Council. Of course he was quite in favour of a new charter. He thought there were a great many reforms required. But he would very much like to know what that charter was going to be before he pledged himself to vote for every clause of it. As regarded the election of vice-presidents by the profession, he did not suppose that anybody in that room knew that some years ago Professor Axe (?) moved that the president should only be elected after a certain number of years, and vice-presidents in a certain way, while he (the speaker) moved as an amendment that three of the vice-presidents should be elected from those men who had obtained a certain percentage of votes from the profession. He would still like to see a certain number of vice-presidents elected by the profession.

The proposition was put and carried after a few words from Capt. RUSSELL.

Mr. GEORGE SMITH: I suppose it is impossible to run two candidates?

The SECRETARY: It means defeat.

Mr. SMITH: We have another old member of this profession whom we must not forget, I mean Professor Pritchard.

The PRESIDENT: I must say myself that you wont forget that Professor Pritchard is a Midland Counties man. You cannot have a better representative.

The SECRETARY explained that it would be a tactical mistake to adopt two

candidates, but said that he would be extremely pleased if most of the members would use their individual rights to support Prof. Pritchard.

The PRESIDENT: I know well that he is in favour of the abolition of the ninth clause.

The subject dropped, and the TREASURER read his annual report, which he considered highly satisfactory, the balance during the year being advanced from £156 2s. 6d. to £174 15s. 3d.

Mr. OLIVER proposed, Mr. BARBER seconded, and the meeting adopted a resolution of condolence with the wife of the late Mr. Reynolds of Daventry.

PENETRATING WOUNDS IN THE FOOT OF THE HORSE.

By Professor WALLEY.

The Professor considered his subject under two heads:

(1.) Penetrating wounds resulting from the accidental introduction of foreign bodies into the sensitive structures of the foot.

(2.) Penetrating wounds resulting from, or connected with, shoeing.

In reference to the first class of injuries he pointed out that the bodies which most largely produced such wounds were packing nails, and that they were of more frequent occurrence in town than in country practice, and that the accident was most largely caused by animals placing the foot on the head of the nail and tilting the point upwards—the great weight of the body facilitating penetration; that such penetration took place most frequently in the commissure, about one to one and a half or two inches from the apex of the frog; that while, as a rule, only one nail was found in the foot it occasionally happened that two ormore were picked up and were apt to be overlooked by the practitioner. Such accidents were largely encountered in groups of threes and fours. Some of the most serious wounds were those met with in the feet of horses engaged in the removal of timber from plantings in which the brushwood had been recently cut down, in hunters passing through plantations, or over recently laid hedgerows, and in agricultural horses by treading on harrow tines. The depth of penetration was regulated by the direction in which the object passed and the point of impact—the injury being frequently modified by the penetrating object doubling over, or by the height of the heels of the shoe and the toe pieces. Such wounds were often rendered more serious by the penetrating object breaking short off in the tissues, and if the horn closes over it, it is apt to be overlooked on examination. The injuries were most frequently inflicted in the sensitive sole, the sensitive frog, the os pedis, the navicular bone, the tendon of the flexor-pedis, and its bursa. Occasionally the os pedis was fractured more rarely, or the penetrating object passed through the bone and became clenched on its anterior surface. The indication of the penetration of foreign bodies was in some cases characteristic, in others ambiguous. In most instances lameness was observed immediately on the receipt of the injury and the animal was found—in the case of the hind foot—with the fetlock flexed and the weight thrown on to the toe, or alternately elevating and extending the foot and then placing it on the ground carefully; that in most cases swelling and tenderness of the tissues at the back of the leg, with throbbing of the plantar arteries, was detected on examination. In seeking for evidence of the penetration of foreign bodies every suspicious looking mark in the sole should be followed to its termination. In extracting such bodies it is sometimes necessary to chip off or remove portions of the os pedis with a chisel or a gouge; in all cases the surrounding horn should be carefully thinned, and the mouth of the wound freely opened.

An antiseptic should in all cases be introduced into the utmost recesses of such wounds. Preference over mineral acids (usually employed) being given to carbolic acid, solution of corrosive sublimate or chloride of zinc,

terebene and turpentine; the effects of such injuries should not be underestimated, but rather the patient should be thrown off work for a few days, and the foot carefully fomented or poulticed. In all severe cases the animal should be put in slings, and damage to the uninjured limb avoided by putting a high-heeled boot on the foot and applying a bandage to the leg. Laxatives, sedatives, and anodynes should be administered to the patient when necessary.

In speaking of the results of such injuries, it was pointed out that they depended upon the structures injured and the constitutional condition of the patient; that the most serious results were caries of the os pedis, inflammation of the flexor-pedis tendon or its bursa, open navicular bursa, deep cavities followed by abcess, Cellulitis, Septicæmia, Pyæmia, and Tetanus. In the treatment of results the professor advised that excessive granulation was best dealt with surgically, *e.g.*, by the knife, the scissors, or the actual cautery, such treatment being productive of much less suffering than was inflicted by potential cauteries. Whenever the separation of the frog or sole took place, an exploratory groove should be cut from the point of entrance of the foreign body to the point of exit of the pus; in all cases where pain and lameness continued without any evidence of suppuration, injury to bone might be suspected; and such injury is frequently followed by corns and exfoliation. Fracture of the navicular bone was frequently followed by permanent lameness. Bursitis was indicated by formation of a puffy swelling in the hollow of the heel followed by the formation of abcess; that open navicular bursa was best treated by mascerating for several hours daily in a strong solution of corrosive sublimate and cuprum sulphate, with the application of blisters to the coronet; that whenever caries of the os pedis was evidenced, the destroyed portion of the bone should be removed without delay, and the resulting wound dressed with carbolic acid, and a blister applied to the coronet. Lameness remaining as a result of any of the complications mentioned was best combated by irritants applied to the coronet, *e.g.*, by pyro-puncture, blisters, or at setons, that the progress of Cellulitis should be checked by the application of a blister at the seat of the uppermost limits of extension, and that immediately evidence of suppuration was attainable the damaged should be freely incised, and irrigated with antiseptic solutions. Blood-poisoning should be prevented or combated by the use of appropriate remedies.

In dealing with injuries resulting from shoeing, the essayist directed attention to the terms usually employed to designate the different forms of injury as pricks, and stabs or drawbacks—the term *prick* being applied when the nail is left in contact with the tissues into which it has been driven, and the term *stab* or *drawback* when the nail is withdrawn. The most important predisposing and actual causes of such injuries, it was pointed out, are abnormal conditions of the hoof itself, bad quality of nails, improperly fitted shoes, or inartistically fullered shoes or pointed nails, viciousness or restlessness on the part of the animal, and faults of the smith. The professor, in this connection, emphasised the fact that such injuries as those under consideration were of far less frequency, and the results of less importance at the present day than was the case a few years ago; and he attributed this to the operation of several factors, *e.g.*, the better education of the shoeing-smith, the introduction of a better and more uniform quality of nail, the greater care taken of the foot of the horse, and the more universal superintendence of the V.S., and the results of such injuries were less serious than of old by virtue of the fact that the services of the V.S. are sought at the outset of the lameness.

In reference to the results of this class of injuries the essayist pointed out that they depended (*a*) upon the structures involved, and (*b*) on the extent of

the injury; that in the case of the penetration of the sensitive laminæ, or sole, or between these structures and the bone, the results were more serious than when penetration took place between the sensitive and horny laminæ, or between the sensitive and horny sole; as in the former case the suppurative action extends to the coronary cushion—giving rise to necrosis of the lateral cartilage, to formation of sinuses (quittor), to Ostitis Peistitis, Arthritis, Cellulitis, Sphacelus, Pyæmia and Septicæmia—or to the undermining of the whole of the sole; while in the latter the resulting lesions were more superficial, and far more easily dealt with.

In the management of such injuries the importance of seeking for evidence of extension of suppuration when such was not well defined, by making vertical exploratory incisions through the wall, was particularly dwelt on, the essayist pointing out that he was, personally, quite satisfied when on making such incisions he found that the sensitive structures were normal in character, and that blood was readily obtained, but that when they presented a par-boiled appearance or were highly congested he was suspicious of deep-seated mischief and continued his search; he deprecated hoof-stripping, asserting that inasmuch as the same end could be gained by the use of the knife and the rasp with a minimum of suffering, and without incurring the same amount of injury to the sensitive structures, it was unnecessary and cruel. In these cases where evidence was forthcoming of pedal necrosis, the essayist contended that the exfoliating structure could be readily removed by the aid of a drawing knife, without having recourse to more heroic surgical measures. In the general treatment of such injuries, attention was directed to the necessity of placing the foot in a state of rest, of removing pressure from the injured parts, and at the same time, of protecting both the damaged structures and the sound bone from further injury by appropriate shoeing. As a preventive to injuries inflicted by picked-up nails, the professor advocated the use of leather soles and pads; and as preventives to injuries in shoeing, he advocated improvement in the education of the smith—not only in respect of his art, but in a knowledge of the anatomy and physiology of the foot—the more extended supervision of the Veterinary Surgeon, and the registration of competent men. While in connection with the protective aspect of the question, he pointed out the conditions under which the employer could be held responsible for the act of his workmen, and urged upon his hearers the necessity of insuring, and joining the Defence Society.

Mr. GEORGE SMITH said they must all be very grateful to Prof. Walley for his excellent paper. Would he kindly explain whether he would apply blisters at the time the synovia was escaping? His own idea was that at this period the foot must be kept perfectly still, and a horse's foot would not be kept still while it was blistered.

Mr. H. STANLEY was of opinion that in all cases of open joints the finest treatment in the world was to put on a patten shoe and to blister. A horse would soon get his leg at rest if he was blistered properly. As to shoeing-smiths, however, he disagreed entirely with Prof. Walley. When blacksmiths got a little knowledge, it proved very dangerous. They should as much as possible be kept in their proper place; otherwise, after the first row he had with the surgeon who employed him, a blacksmith would go and set up in business and call himself a farrier.

Mr. BARBER said he had found that in cases of Synovitis due to a fracture in the bursa, a solution of bichloride of mercury with liquor plumbi—a most unchemical combination—acted splendidly. He liked to apply the cold-water pipe, too, instead of blistering. In open wounds he believed in blistering sharply.

Mr. STANLEY interposed again to say that he would be pleased to see the patten shoe of which Prof. Walley had spoken.

Captain RUSSELL said that there had been a remarkable diminution in the number of injuries to the foot, either because blacksmiths were better acquainted with their work, or, as he believed, because nails were nowadays made of a proper consistency and were easily driven. At Grantham, where the injuries met with were mostly caused by pieces of tin, metal, and glass picked up, a rather simple but a very effectual treatment was practised. They immediately removed the shoe, had the foot pared down as low as possible, and put the foot into a poultice. The dressing they used was that spoken of by his friend Mr. Barber, and was described in Gamgee's *Vade Mecum*. In open joints, as soon as they could reduce inflammatory action, they applied the oil of cloves with good results. They used a plate shoe, bound up at the toe so as to fit into the clip and screwed at the heel with two screws. It could be easily taken off for inspection of the wound.

Mr. GOOCH described a simple treatment for injury to the sole in cattle. It consisted of binding the wound, giving a free escape to the pus, cauterising the wound with the pure nitrate of silver, and applying boracic acid in a common bag.

Mr. BARBER thought there was no better treatment than butter of antimony. It caused the least pain, if the action of the animal was to be taken as an indication.

Professor WALLEY doubted this.

Mr. G. G. MAYOR having narrated a curious case occurring within his experience, which was very difficult of diagnosis,

Sir HENRY SIMPSON tendered his thanks to those present for their kindness in asking him to come to Birmingham. With regard to the Farriers Company's scheme for the registration of shoeing-smiths, he thought he should throw in his lot with Prof. Walley, and he trusted that gentlemen in the veterinary profession would agree it was the right and proper thing. It would not do nowadays to say that any body of men must be kept in ignorance. The tendency of the age was entirely against that; and the shoeing-smith was an artisan, and a man who occupied a very important position in the social economy. He thought that the Farriers' scheme was one likely to work a great amount of good. He saw no harm whatever in a man who had got to deal with the foot, knowing what it consisted of. He did not think that likely to make the man dabble in what did not concern him. In fact, if he was a registered shoeing-smith he would not be allowed to dabble, because his certificate might be taken from him if he went outside his own calling. Registration therefore was, in his opinion, likely to be beneficial alike to the shoeing-smith and the veterinary surgeon. It would tend to elevate the profession indirectly, because gentlemen who took an interest in shoeing—hunting men especially, who valued horses with high action—would be likely to appreciate the veterinary surgeon who took the view that the education of shoeing-smiths was important. He thought that he could mention another cause of injuries to the foot. Within the last forty-eight hours he had been shown a shoe which could be put on without nails. It was an ordinary shoe with indiarubber, with no strips, but with four iron clips which were knocked up from outside and which had a jagged edge inside, that would catch in the crust. One valuable horse was shod with them, and pawed one shoe off the next night. There was nothing in the invention, but the remarkable thing was the inventor had got two or three good testimonials. They would see, however, that if a horse got his shoe off in the night he was likely to tread upon it in such a way as to suffer injury. As to animals in excessive pain, he need hardly remind them that sometimes their suffering was so exhausting as to cause death. He remembered talking this over with Mr. Cox, who told him that he had once had occasion to divide the nerve, and who said that he thought it desirable

in extreme cases to do so. As to the diminished frequency of pricks, he was disposed to think that the better manufacture of nails had much to do with it.

Mr. J. BLAKEWAY was inclined to agree with Mr. Stanley as to the farriers. These men would be saying they knew as much about the foot as veterinary surgeons, and their certificates must therefore be granted under very strict regulations. As to discharge of synovia, very great benefit was obtained from pressure on the under surface. His old partner used to recommend a dressing of alum and oxide of mercury for open joints, put in and wedged up with strips.

Capt. RUSSELL said that unless there was very careful registration, he feared that farriers would in the immediate future gain some ascendancy over veterinary surgeons, though twenty or thirty years hence registration would prove to have been a beneficial thing. The upper classes were easily imposed upon. They were always talking about shoes, and for the most part they knew nothing about them. A gentleman would take his horse to the smith, and the smith would say, "Oh, I can put that right. I am a registered shoeing-smith, and I can sell you white oils and any dressing you may require." The gentleman would say, "I was going to send for Russell or Wragg, or Sir Henry Simpson," but the smith would reply, "Oh, that doesn't matter, I know all about it; here's my certificate."

Prof. WALLEY: Who is going to teach them?

Capt. RUSSELL: Well, we shan't get the credit for it.

Prof. WALLEY: You will, if you teach them.

Mr. TRIGGER urged the advantage of always removing the horn in case of punctured wounds, and the necessity of ignoring all assurances to the effect that the blacksmith had already had the shoe off. He thought the most painless cautery was the actual cautery. He had had great difficulty in applying potential cauteries after the first few days; and having resorted to the actual cautery, so that he could stand better, he had been surprised to see that the animal hardly seemed to feel it, but stood perfectly still. One reason why pricks were less frequent was that the shoeing competitions at shows had taught blacksmiths not to pare and rasp the feet. He was not a bit afraid of the registration of shoeing-smiths. He welcomed it. The more they elevated other classes of society the more they raised themselves. When they were registed, smiths would not be one iota better able to sell white oils than they were now. The fact that already there were 700 applications for registration showed that the scheme would be a success, and veterinary surgeons would study their own interest if they were in the swim. He believed, too, that it would be a very great safeguard against actions at law to have employed registered shoeing-smiths.

Mr. OLVER said that in open bursa he found great success from carbolic acid and chalk, made into a paste and pressed tightly home. As to the registration of farriers, he thought it a great misfortune that the veterinary profession had not been kept posted on the question. He did not think it mattered two pins to the profession whether farriers were registered or not, but he would like to know what entitled a man to be registered. Indiscriminate registration would be wrong.

The TREASURER said that all veterinary surgeons should be furnished with the information Mr. Olver had asked for. Many who were without it had seen their foremen furnished with it, and he thought it was the duty of the Registration Committee to write to the masters themselves.

The PRESIDENT explained that the Secretary of the Committee had been under the impression that no veterinary surgeons kept forges; but his error had been corrected.

Mr. STANLEY: I told my shoeing-smiths they could do what they liked, but the moment they sent in an application they must pop off.

The PRESIDENT: I think you will find, gentlemen, that the matter has been put right.

Sir HENRY SIMPSON said that he did not want to stand sponsor for the Farriers' Company, but they had the co-operation of the Royal Agricultural Society and the Royal College of Veterinary Surgeons. The intention of the Company was to publish a register every year, and to circulate it everywhere, so that veterinary surgeons and other employers of shoeing-smiths should be enabled to assure themselves of these men's qualifications, and if not registered should decline to employ them. He was sure the Worshipful Master of the Farriers' Company would be extremely sorry when he heard, as he (Sir H. Simpson) would take care that he did—that anything had been done which any veterinary surgeon could construe into an act of discourtesy. Why the foremen should have been approached instead of the master he really did not know.

The PRESIDENT, in summing up the debate, said that the worst cases of punctured feet that he had noticed were those in which the puncture was just by the junction of the sole and the frog, and about one to two inches from the point. As regarded the treatment during discharge of synovia, he quite agreed with the patten shoe, but what he called a patten shoe was an ordinary shoe with a piece of iron attached to each heel at a slight angle, and a bar at the bottom. Horses in most excruciating pain, after being supplied with it, began to find that it rested them, and so the circulation in the foot went on properly. His lotion for the discharge of synovia was a preparation of carbonate of lead and oxide of lead, and he would be pleased to give the exact prescription to anybody who would like to try the lotion. He had tried all sorts of other things, but had never been so successful as with that lotion. Of course, as soon as he got the discharge stopped, he went on to blister, and repeated the blisters as often as he could, putting a good poultice round the coronet after two or three days to get the scurf off, and repeating the blister on the new surface. When horses suffered excruciating pain, he was very fond of giving them a good dose of chloral hydrate night and morning. When there were exuberant granulations, he had used chromic oxide for some time past with good effect. If a horse was pricked it was mostly the fault of firemen who made the shoe, and who put the holes in wrongly. The door-man used to take such shoes back to the fireman, but nowadays he seemed afraid to do so. In conclusion, he said that a veterinary surgeon who knew anything about shoeing had never the time to give superintendence to the forge. He, himself, hated the sight of his forge, and was of opinion that all veterinary surgeons would be better without forges.

Prof. WALLEY, in reply, said that Mr. Smith must remember that if the foot did need rest, blistering was the best method of securing it. He would insist upon the application of a blister, either to an open joint or to a persistent lameness without apparent cause. He failed to see why smiths should not be taught the anatomy of the foot and to some extent its physiology. Unless a smith had some notion of what he was knocking his nails into, he could no more shoe a foot properly than an engine driver could do his work if he did not know something of the construction of an engine. A horse's foot was not a block of wood, into which you could knock your nails anywhere. He did not think they would make any more quacks by instructing these shoeing-smiths than they would by leaving them alone, and if they threw aside all connection with the shoeing-forge, they would produce more quacks than ever. Most of the quacks he had met had been master smiths. Registration would be the best possible check upon them, for any man who tried to use his position for an illegitimate purpose would be punished at once. As to cold water, it was his habit in carrying out the system of treatment he had advised in connection with navicular bursæ, to use cold water after the action

of the blister had passed off, and after a few days of the hose to replace the blister. The effect was better than if a blister had been continuously applied. He agreed with the use of plate shoes and pressure. The claim to efficiency which had been advanced on behalf of oil of cloves was probably its antiseptic property, though to some extent, of course, it was coagulative. As to butter of antimony, he had seen it applied to sheep, and never without appearing to cause intense pain. He did not believe in the plugging of orifices and open joints as long as there was inflammation; it did a vast amount of harm then. A good plug, when the inflammation and discharge were got rid of, consisted of quicklime, which was quite aseptic. As to the use of bichloride of mercury and sulphate of copper, his plan was to macerate for a couple of hours with a strong solution. He dissolved two ounces of each in a solution which just covered the hoof. This did not interfere with the blistering, because it did not come in contact with the blister, the solution finding its way to the parts by capillary attraction. Bichloride of mercury with acetate of lead was a capital antiseptic.

A vote of thanks to Professor Walley was heartily adopted. It was decided to hold the next meeting at Worcester. The members afterwards dined together, and a very pleasant evening was spent.

ROYAL COUNTIES VETERINARY MEDICAL ASSOCIATION.

THE general annual meeting and dinner took place on February 27th, at the Great Western Hotel, Reading. Mr. W. Wilson, president, took the chair. There was a good attendance of members and visitors. Mr. G. T. Cannon, M.R.C.V.S., Bicester, Oxen, was unanimously elected a member. It was agreed to hold the next meeting at Didcot, on the last Friday in June.

The PRESIDENT then read his inaugural address, followed by a paper on "Tuberculosis in relation to Veterinary Science." Mr. Wilson's paper, which was well received, was illustrated in a most beautiful manner by the oxy-hydrogen lantern, manipulated by Mr. P. D. Coghill, of the research department of the R.V.C. The actual tissues were shown in many cases mounted as for a microscope, but enlarged through the lantern, and their exquisite preparation was greatly admired. A number of photographs were also thrown on the screen:

Sections of Normal Lung of Child injected.—

Gangrenous Pneumonia, child.
Collapsed lung, child (2).
Miliary Tuberculosis (3).

Caseating Tuberculosis and Pneumonia—Plate Cultivation of Organisms found in Air.

Tuberculosus Bacillus in position	1000
Mould—Aspergillus Niger	1000
Anthrax—Mouse spleen	1000
Brewer's Yeast, Budding	1000
Cholera Bacillus	1000
Typhoid Bacillus in Clusters	1000
Edington's Scarlatina Bacillus	200
Organisms found in Urine	1000
Tuberculosus Bacillus in human sputum	1000
Injected Brain	250
„ Retina, Dog	20

INAUGURAL ADDRESS.

GENTLEMEN,—I will begin the few remarks I have to make by thanking you, most sincerely, for the honour you have conferred upon me by electing me president of this Association.

It was with considerable diffidence that I consented to my name being proposed for this important position, and I must say that subsequent consideration confirms me in the opinion that I shall make a very inadequate successor to those gentlemen who have preceded me, especially our last and esteemed president, Mr. Wheatley. Gentlemen, I can scarcely conceive it possible that we can sufficiently estimate the advantages which we, as veterinary surgeons, can derive from Associations like this. It is by meeting together for mutual improvement, by interchange of ideas, and by discussing professional subjects, that we are in a manner stimulated to work up to, and keep place with, the advancing science of the day, acquainting ourselves with the latest discoveries, and the newest, both of medical and surgical methods of treatment in connection with the many and important points arising in our profession. These Associations are also the means whereby any important questions which concern the well-being of the body corporate may be discussed and analysed, and thus our representatives on the Council may obtain possession of the views entertained by the profession generally.

It is not my intention on this occasion to touch upon any of the controversial topics now before the council, as time will not permit of their discussion. I hail with thankfulness the kindness and liberality of the Central Veterinary Association in presenting the sum of £50 to the Royal College as a nucleus for a prize fund, which example I trust may be followed by other Associations. It occurs to me that it will be a great satisfaction to the profession generally that our Council have settled the question as regards the matriculation examination, thus raising the standard, and making it uniform for the whole kingdom.

The whole civilized world has quite recently been thrown into a state of wonder at the startling discovery announced for the cure of Tuberculosis, and I merely mention the fact in passing to remark that our Council have not been unmindful of what they considered their duty as the representatives of a scientific body, by voting a sum of money, and placing it in the hands of a committee for the purposes of testing the merits of Dr. Koch's discovery, at any of our veterinary schools, or to engage the services of some suitable member of our profession who shall proceed to Berlin, and investigate the matter on behalf of the Royal College of Veterinary Surgeons.

Turning from the examining to the teaching college, those of us who are graduates of the Camden Town School cannot fail to be struck with the great advantages that our present students of veterinary medicine and surgery have, in comparison with those enjoyed by their predecessors of only a few years ago. Now, in addition to the regular teaching staff of the College, there are gentlemen eminent in their respective spheres in the medical profession, who are giving a series of lectures on their special subjects, and which cannot fail to be of the greatest interest and utility to the students. To mention such names as Dr. Crookshank, Mr. Bland Sutton, Mr. Hickson, Mr. Power, and Mr. D'Arcy Power will be sufficient to show that the veterinary student of the present day has many and great advantages which his predecessors did not enjoy.

Tuberculosis.

At the present day there is no subject in either the medical or veterinary professions receiving so much attention as this fell disease—in fact we may say that it is almost monopolising the energies of pathologists to the exclusion of everything else, but, unfortunately, while we know more and more of the life history of the micro-organism believed to be the cause, we still seem to be as far as ever from finding a remedy against its ravages.

Bacteriology, the youngest of our departments of science, while yet in its infancy received an impetus from the researches of M. Pasteur, in France, simply because his work produced positive results, and because the subject-

matter of his labours was intimately connected with many of the leading industries of his country. Before that time almost all of the investigations into the life histories and action of the minute fungi which we now term micro-organisms or bacteria, were of interest only from a scientific point of view, but when Pasteur conclusively demonstrated the cause of the disease among silk-worms, and pointed out an efficient method of curing the same, he appealed to that place where it is said mankind "can feel the most," *i.e.*, the pocket. It is needless to say that since that time the world at large has been placed under many further obligations to this noble Frenchman, in consequence of his work and researches relating to Anthrax, Fowl Cholera, Swine Fever, and lastly, Hydrophobia, and whether we agree or differ from him in the conclusions he has arrived at, we must agree that the steadfast energy of his pursuit deserves success. In England we have had our fair share of discoveries in the domain of pathology and bacteriology from the immortal Jenner, and his vaccination against Small-pox—from the introduction of antiseptic surgery by Sir Joseph Lister, which has rendered possible operations otherwise beyond our power, and which has so much reduced the dangers of, and mortality from the operations performed to arrest the progress of disease, and stay the hand of death. Let anyone read the statistics of the operating theatre before and after the introduction of antiseptics (for any given amputation or operation), and I am certain they will agree that Sir Joseph Lister is well worthy of a place on the roll of fame, alongside Pasteur and Koch, both of whom, though representing very different schools, rank among his many friends. And now, in the present day, we can look with pride and pleasure to the work done by Mr. Hankin and the late Dr. Woolridge. True it is that a great portion of it had to be done in Berlin, on account of the restrictive operation of the Anti-Vivisection Acts in this country; but none the less, we should never forget that these two Englishmen were the first to realise the importance of what are called the toxalbumens, and that they worked out the effects of these powerful compounds derived from the organism of Anthrax, and that in this way, and through them, Koch took up the same line of research in the case of Tuberculosis which has resulted in the now famous "Tuberculin," or "Koch's Fluid." But while France and England can claim each their own leaders with justifiable pride, Germany is not one bit behind, for the name of Koch —Dr. Robert Koch—will ever shed a lustre over the German schools of science. Like his compeer, Pasteur, he is a hard and conscientious investigator, respected by all who know him, beloved by his patients, adored by his pupils. To his investigation we owe all we know of the micro-organism of Cholera, and a good deal of information about Anthrax as well, but, of course, his many years of labour which resulted in the discovery of the Bacillus Tuberculosis, and still later his proposed remedy against its ravages, has made his name a household word all the world over.

The life history of many of the organisms which are classed as pathogenic has been carefully watched under varied conditions, and each stage has been duly placed upon record, but unfortunately this has been an impossibility in the case of the tubercle bacillus; partly on account of its extremely slow growth, on account of its small size, on account of the difficulties of finding suitable media upon which to cultivate it, and because of certain other difficulties, optical, physical, and chemical, but we do know as the results of observation by many investigators in various parts of the world, that it is governed by the same unchanging laws of nature which control the actions and the reproduction of species. We know that it does *not* originate spontaneously, but that like other fungi the mature plant may form spores, which, differing in their constituents from the plant which produced them, are able to resist, to a surprising degree, the action of heat, colds, acids, and

alkalies, so that even after a lapse of months, or years, we may have a *renewed growth of the organism*, and of course this, in our ordinary practice, we term a *fresh outbreak of the disease*. No doubt you expect me to say something about this remedy for Tuberculosis, but first of all, allow me a few words about the disease itself. What is it? How does it run its usual course? Is it really incurable or not? Have we yet found a cure, and if so, what is the cure in question?

What is it? The name "Tuberculosis" is a most suitable one, for in almost every case its presence and progress is marked by the formation of tubercles or nodules in the affected part, or rather this is the first naked eye appearance; but then the question arises: How come these tubercles to be formed? and this we answer by referring to Koch and his work. A minute fungus or bacillus which can only be seen by the aid of powerful lenses, and which measures about one six-thousandth part of an inch long, obtains an entrance into the body of either man or animal by inhalation, ingestion, or inoculation, and if there happens to be any part or organ of the body in a receptive condition, there, in all likelihood, will this micro-parasite find a suitable field for its further development and growth. We know that by its action upon and within the tissue, and it may be by the chemical action of products given off by the organism, that the tubercucles or nodules we have just mentioned are set up. If we harden, section, mount, and microscopically examine the tissue in which tubercular lesions have taken place, we will find that there are numerous charges in the histological structure, conspicuous among which are the formation of giant sells and ordinary cells in the process of degeneration. I now show you on the screen what the giant cell formation is like, because it is one of the most certain indications of tubercular degeneration. If now you stain the tissue in which giant cells have been discovered with fuchsine or aniline dye, by any of the well known methods, you may find in and around the giant cells the bacillus Tuberculosus more or less numerous; that on the screen represents the organisms in the spleen of a rabbit, and the previous one is taken from a case of Tuberculosis in man, and you will notice how much alike in both cases is the distribution of the organisms. When, by ingestion, this bacillus invades an animal, we look for the lesion in the mesentery and glands, in the liver, and in the intestine, and it is not unusual to find the organism vary in size in the different organs of the same animal; for this phenomenon, however, I can offer you no explanation. The photograph now on the screen represents the bacilli as found in the wall of the small intestine of a pig, and you will observe that they appear very much larger than those we have just seen in the giant cells.

Upon the authority of Prof. MacFadyean, of Edinburgh, we have it that the horse is peculiarly subject to the action of this parasite, and certainly the greatest number of them from one field that ever I have seen was obtained from a case of Tuberculosis in the horse at the Royal Veterinary College a few weeks ago. We may well hope that some action will be taken by our rulers, as a result of the present Tuberculosis Commission, for it may already be considered as a matter settled beyond all doubt, that this fell disease *can be and is* transmitted from man to animals, and from animals to man. It is with great pleasure that I tell you that the veterinary profession is working hand in hand with the investigators of the medical schools, and I am certain that the interchange of opinions will be mutually profitable. It is well to remind you, however, that your every day experience proves that there may be tubercles or nodules found in the tissues, which have no connection with Tuberculosis, however much, in some respects, they may appear to be like it; and not a few times have the nodules of Actinomycosis been mistaken for Tuberculosis by the unwary (when only a cursory examination could be made; but of course the microscope reveals the difference, if other methods

fail. On the screen I now show you a photograph of Actinomycosis, the ray fungus as it is called; these photographs are magnified 200 dia., while the Tuberculosus bacillus were magnified 1000 dia., and now you see an actual section of a glandered lung of a horse studded with nodules all over, you may compare it with nodules of Tuberculosis in the lung of a young child, which will next be shown.

Are we to consider Tuberculosis as one of the incurable diseases? This is a most important question, and demands our serious consideration, although it goes without saying that it is of more importance from a medical than from a veterinary point of view; in that case the life of a human being is at stake—a life which is beyond all price, while from a veterinary side of the question it is (and ever will be) only a matter of £ s. d., but even in this respect the question is important, and we will hail with satisfaction the time when a remedy is discovered, but that time is not yet. A few months ago we were in high hopes that the remedy was found. to-day we are bound to confess the prospect is by no means so bright. Dr. Koch, working upon the lines of our countrymen, Hankin and Woolridge, determined that the toxalbumen formed by the bacillus Tuberculosus was a certain medium by which the disease itself might be *diagnosed*, and he, also, had *some idea* that by introducing it into the circulation of the patient, that the further development and reproduction of the bacillus might be arrested, or indeed altogether stopped. Most unfortunately, as it turns out, he was forced by his emperor, at the instigation of indiscreet friends, to prematurely disclose his views and plans, and while Koch himself, upon each and every occasion, warned everyone concerned that he was by no means certain of this being the case, the whole world got into a fever of excitement, expectation and hope. At the present time we are in the midst of a reaction which is just as unnatural as was the previous excitement, and when this reaction and disappointment is over, I have no doubt we will be able to appraise Koch's discovery at its true value, as a means of diagnosing, but *not of curing* Tuberculosis. Yet every *post-mortem* room furnishes the physician and surgeon *with evidence of the most certain description* that *the disease is curable*—that Dame Nature knows a remedy for the repair of lung tissue, and for the expulsion of the bacilli, and we can now but hope that some one of the many earnest workers in the near future may discover that secret.

I must, however, tell you that in the Royal Veterinary College experiments are now being carried on, and will be published in due course; this much I tell you, because it is right you should know that our veterinary schools are just as much alive to the importance of the investigation as the sister schools of the medical faculty. Experiments have proved that this disease may be communicated from man to the lower animals, and there can be little doubt that from animals it may be transmitted to man. It goes without saying that veterinary surgeons properly trained as inspectors of markets and of our meat supply, in the near future will play an important part in the internal economy of our country, and when that time does come, I know—I feel certain—our profession will be found equal to the occasion—will manfully do its duty and merit the confidence of our citizens.

Mr. SIMPSON moved a very cordial vote of thanks to the president for the great pains he had taken to make the afternoon a most interesting and entertaining one. Mr. Wilson's lecture had been most enjoyable as well as instructive, and the only regret was that more of the members had not been present. Instructive as Mr. Wilson's paper had been, Mr. Coghill's illustrations had very materially aided them to appreciate and understand it. Mr. Coghill had taken much trouble and forethought, and he therefore asked the meeting to accord their hearty thanks to him as well as to the president.

Mr. HANKS seconded the motion, which was supported by Mr. HURNDALL, and carried by acclamation.

H. KIDD, *Hon. Sec.*

REMOVAL OF NAMES FROM THE REGISTER OF THE ROYAL COLLEGE OF VETERINARY SURGEONS.

SECOND list of names of members removed from Register through noncompliance with Section 5, Sub-section 4, of the Veterinary Surgeons Act, 1881.

Arthur, David, Australia.
Allen, David.
Armstrong, Fred., Cockermouth, Cumberland.
Aitkin, Alex. Murray, Australia.
Atkinson, John Todd.
Bagster, Jonathan, London.
Baird Alex. B., Rutherglen, Lanarkshire.
Bolton, Geo. Fredk., Montreal, Canada.
Bradshaw, Samuel. Stratford-on-Avon.
Bretherton, John, America.
Beech, T. S., California.
Brock, Edward J., Australia.
Barker, John, Australia.
Barber, Robert H., Australia.
Burrows, H. A., London.
Boreham, James H.
Borthwick, James, Australia.
Bott, J. E., New Zealand.
Clark, William, Australia.
Clark, John, America.
Clemenson, John.
Clements, Wm., Trinidad, W. Indies.
Colquhoun, Archd., Bengal.
Constant, Arthur Edward, Clapham Road, S.W.
Coster, Laurence Henry, America.
Crundall, Edward, America.
Coleman, J. B., New York.
Clegg, P., Kingston, Jamaica.
Darling, Thos. Bell, Australia.
Davies, Joseph, London.
Durham, Samuel, Dunedin, New Zealand
Eaton, J. S., London.
Elliott, Thos., London.
Ferguson, Jas., M.D., Cuba.
Fisher, Isaac, London.
Fox, Edward, London.
Frater, William, America.
Fenner, James, Australia.
Green, Philip B., Bengal.
Gulleford, W. W., Islington.
Griffiths, Thos. S., Australia.
Haggard, Edward, America.
Halket, Alex.
Hingston, J. Compton.
Hoey, James W.
Hill, Geo., London.
Hood, Fredk., New Deer, Aberdeenshire.
Hope, Geo. J., London.
Howcutt, John.
Hulme, Thos. D., America.
Hutchings, Alex. J., Australia.
Harris, W. N. A., New York.
Hawes, Robt., London.
Hay, Adam, Australia.
Hayden, P. W.
Heriott, A., Falkirk, Stirlingshire.
Hill, Thos., New Zealand.
Hutton, G. A., Cape of Good Hope.
Horton, J. M., Australia.
Holland, C., India.
Horsburgh, James, jun., New Zealand.
Jackson, Charles, Madras.
Keen, John, London.
Keyland, John, Calcutta.
Lauder, Charles, America.
Lee, James, London.
Lee, John, America.
Lord, Roland A., U.S. America.
McDonald, James Grant, America.
McIntosh, William.
Maclachlan, David, America.
Marriott, John, Guelph, Canada.
Martin, Timothy, London.
Minor, A. D., Manchester.
Montray, Luke Drummond, U.S. America.
McIntosh, R., Australia.
Muston, F. H.
Morton, G. H., New Zealand.
Newton, Peter, America.
Naden, Greatrex, New Zealand.
Palmer, James, London.
Petley, John, America.
Power, Nicholas, Kildare, Waterford.
Potts, Robert, Australia.
Quallett, James, New York.
Revis, Leonard, America.
Rishmer, H. K., London.
Robb, G. W., Glasgow.
Rugg, F. G., Chesham, Bucks.
Sawyer, J. A., London.
Sedgeley, G., Bengal.
Shaw, Thos., America.
Skitt, John, London.
Smallbones, G. B., Hungary.
Smith, Edward, London.
Smith, Whitfield, America.
South, Geo., jun., McLeod's Mews, S. Kensington.
Stewart, W., Glasgow.
Sunderland, R., Midgley, near Halifax.
Thompson, James, Canada.
Thornton, John, London.
Thornton, John Brace, Edinburgh.
Tills, John, America.
Tunzelmann, von Nicholas, Canada.
Turner, —, London.
Tyzack, William, London.
Vincent, Edwin, Madras.
Vincent, John Philip, Melbourne, Australia.
Wagstaff, Thos., London.
Wagstaffe, W. J., Warminster, Wilts.
Williams, Charles E., Melbourne, Australia.
Wilson, Archibald A., Africa.
Whitney, John, New Zealand.

EPIDEMIOLOGICAL SOCIETY.

Saprophytes and Parasites.

AT the meeting of this Society on February 18th, Dr. Louis Parkes read a paper on, "The Relations of Saprophytic to Parasitic Micro-organisms." Saprophytes, he said, were those bacilli, micrococci, etc., which, living on dead organic matter only, swarmed everywhere in the air, earth, and water, and to which, in conjunction with moulds and yeast fungi, all fermentative and putrefactive processes were due. The parasitic micro-organisms, on the other hand, preyed on living matter only, or equally with dead. The power of attacking non-living matter, which was evidence of a certain degree of saprophytism, enabled us to cultivate many pathogenic organisms in artificial media. These, which included the microbes of Tubercle, Diphtheria, Anthrax, Erysipelas, Tetanus, and many others were called "facultative" parasites, while those which were not as yet known to develop out of the living animal were termed "obligate." To the latter class belonged the micro-organisms of Small-pox, Vaccinia, Whooping-cough, Measles, etc., and of them we necessarily knew but little. The division, however, was only provisional. Another subdivision of the parasites had been proposed, namely, into (1) non-infectious but toxic organisms, and (2) the truly infectious. The latter, including those of the Exanthematous Fevers, were found to pervade the blood and every organ of the body; the former, of which those of Diphtheria and Tetanus were typical examples, acted on the organism through the toxines or ptomaines which they produced. Closely corresponding with the division of parasitic micro-organisms into obligate and facultative was that of the respective diseases into epidemic and endemic on etiological considerations. Whatever the explanation of immunity conferred by one attack against subsequent infection, it was peculiar to the epidemic class, the endemic diseases, as a rule, conferring little or no such protection, though it would seem that some degree of insusceptibility was acquired by long residence in infected localities. It was an interesting question whether such pathogenic organisms might not be developed by a long process of evolution from the non-specific saprophytes of the place, and that the comparative insusceptibility of the native populations might not be attributable to the previous influence of transitional and less virulent microbial forms, not sufficient to give rise to the disease, but conferring immunity, which was the opinion of Professor Hueppe and Dr. Cartwright Wood. The attenuation of pathogenic micro-organisms by cultivation under unfavourable conditions, and the fact that these degenerative microbes grew more luxuriantly in artificial—that is, non-living—media than their original forms, seemed to indicate a retrograde tendency or reversion to the saprophytic character. If such processes of evolution were still going on, we could well understand the striking contrast between the uniformity of the phenomena of diseases depending on obligate parasites and the anomalous cases and variety of symptoms exhibited by those caused by the facultative, as Enteric Fever and Diphtheria, and we might yet expect new forms of disease to arise in the world as the result of long previous evolution.

DR. WILLOUGHBY said that he had put forward a rational classification of specific diseases, in which he had used the terms intra and extra-corporeal contagia in almost the same sense as obligate and facultative; and had also in a paper read before this Society, and afterwards in his work on the *Natural History of Specific Diseases*, advanced identical theories of evolution and degeneration, and the same explanations of immunity as well as of the greater variety of symptoms and absence of subsequent immunity in diseases of his extra-corporeal class of contagia, which he held to be less differentiated or specialised than the intra-corporeal or obligate parasites.

Dr. COPEMAN, as a working bacteriologist, was very sceptical as to the evolution of pathogenic from non-pathogenic organisms.

Sir JOSEPH FAYRER, though asserting his disbelief in the communicability of cholera by human agency or material means, urged bacteriologists to pursue their investigations in the calm, temperate, and judicial spirit shown by the lecturer.

NORTH OF ENGLAND VETERINARY MEDICAL ASSOCIATION.

THE Annual Meeting and Dinner of the above Association took place at the County Hotel, Newcastle-on-Tyne on February 20th, the President, A. Hunter Esq., in the chair. There were also present—Members: Messrs. G. R. Dudgeon, and G. Elphick, vice-presidents; and Messrs. C. Stephenson, J. D. Macgregor, T. Aitken, J. Gofton, A. Peele, C. Hunting, W. Stevenson, C. S. Hunting, J. W. S. Moore, W. Grieve, W. Wheatley, J. Brodie Nisbet, D. Dudgeon, H. Hunter, F. Finney, G. Farrow, W. Hunter, J. Aitken, W. Awde, and W. Ashton Hancock, Secretary.

The following gentlemen, members of the South Durham and North Yorkshire Association, were also present on a friendly visit—Messrs. W. Awde, P. Snaith, H. H. Roberts, H. Snarry, T. Bowhill, and F. R. Stevens.

The following were present as visitors: Dr. G. Murray, Dr. Ellis, Dr. Davies, Professors McCall and W. Williams, and Messrs. J. Arup, W. Dotchin, and F. Brydon.

Letters of regret were received for not being present from Professors Cope, Duguid, Walley, and McFadyean, the Medical Officer of Health for Newcastle, and Messrs. Mulvey, Greaves, Peele and Mitchell.

Mr. D. Dudgeon then withdrew his motion with reference to the day of meeting being altered, and in doing so explained that "he found Friday suited most of the members, and especially those gentlemen who were good enough to come and give us the excellent addresses we from time to time received."

THE PRESIDENT'S ADDRESS.

Gentlemen,—I sincerely thank you for the high honour you have conferred upon me, in electing me your President for the ensuing year. When I arrived at our last meeting (being rather late) I was surprised to hear that my old friend Mr. Dudgeon had proposed me as President, and that I had been unanimously elected. This, no doubt, was very gratifying, but if I had been at the meeting in time I would have protested against it, for I have grave doubts of my suitability for the office. Public speaking is not my forte, in this respect differing from my old college friend and immediate predecessor Mr. J. W. T. Moore. However, as it is your wish, I have decided to enter upon my duties as President with the determination, if it be possible, to leave the condition of this Society better than I found it. In this effort I have every confidence you will all give me your earnest and cordial support. With this assistance, and that of our very valuable and painstaking Secretary, I am sanguine of success.

This Society, since it was re-formed in 1879, and probably during its earlier existence, has been the means of doing a great amount of good to its members and, I may also say, to the profession generally. Many of the suggestions sent from our Society to the Royal College of Veterinary Surgeons have now been carried out, and I think they will prove to be to the benefit of the profession at large. This should encourage us to be no way backward in discussing any matters that we think will be to the benefit of our profession, and, after thoroughly agreeing amongst ourselves at once stating our views at head quarters.

Another circumstance regarding our society is that its members are well

disposed to one another, and we are exceptionally free from those unseemly bickerings and petty jealousies that we unfortunately read of in our journals as occurring in some other kindred associations. Of course, we cannot always agree; it would be very tame if we did, but if we cannot convince the member or members holding opposite views, nor be convinced by them, we agree to differ in a gentlemanly manner, and wait for further development of the subject to prove who is right. This, I maintain, is as it ought to be; one of the first objects of V.M.A. is to promote good fellowship.

I am sure you will be glad to hear that we have some of our "old members," who recently left us to form the South Durham and North Yorkshire V.M.A., as visitors to-day. We give them a hearty welcome, and only hope that our next annual meeting may see a greater number present. I trust, gentlemen, that many of you may see your way to join me in paying our return visit, as I would wish to keep up this mutual interchange of visits when instead of one, we will have two strong societies, and thus gain a further advantage. We wish South Durham and North Yorkshire every success. As far as the parent Society is concerned I think there is no fear but we will continue to improve, as the necessity for societies is gradually increasing, owing to the rapid strides science is making, more particularly as regards contagious diseases, many of which are doubtless due to a specific bacillus or microbe, and it is within the range of possibility that antidotes may be found for them all, so we practical V.S. must keep up to the times, and be ready to utilise the discoveries made by experienced bacteriologists as Pasteur, Koch, Crookshank, and many others. I hope some of our members will see their way to read us a paper on the above subjects. We also have had an addition of new members, and hope this new blood will add materially to the strength and continued success of this Society.

The new remedy for Tuberculosis by Koch is exciting the greatest interest in the scientific world, and if extended experience should prove the results to be as beneficial as it is asserted, it will be the greatest boon that has ever been conferred on suffering humanity, even although a good percentage only of patients suffering from this terrible malady recover.

With reference to the application of this remedy to the lower animals, we have, as yet, had no experience to guide us, although I am not sanguine as to the results, for the disease is very often in an advanced stage before it is noticed and, judging from the extensive ravages that the disease has made in the vital organs before attention is drawn to it, it seems scarcely possible that any remedy can effect a cure, but if even it be a sure means of diagnosing tuberculous disease in the first stage, it will be of incalculable value, and will enable the Board of Agriculture more easily to schedule this disease, if they wish, and may be the means of exterminating it.

With reference to the new prophylactic recently introduced to this country by Professor McFadyean for the prevention of Quarter-ill, I have had no opportunity of judging, but if the results are as satisfactory as stated, and there is no danger of its application causing injurious results, it will be a valuable boon to the agriculturists of this country. I have hitherto relied upon setons in the dewlap as a preventive of this disease, and so far as my experience goes, it has been very effective.

The subjects for discussion at the meeting being of such an interesting nature and likely to so fully occupy the time at our disposal, I do not purpose making any further remarks, and conclude by thanking you for your presence here to-day and your kind attention.

The notice of motion by Mr. W. J. MULVEY was then brought before the meeting, and in the absence of that gentleman, a letter from him, addressed to the President, was read by the Secretary, and on the motion of Mr. D. DUDGEON, it was decided to postpone its further consideration, as time would

not permit of going into the question as thoroughly as its importance required.

Endocarditis in the Pig.

The adjourned discussion on "Endocarditis in the Pig," by C. Stephenson, Esq., with notes and microscopic specimens by Dr. G. Murray, was then renewed.

Mr. STEPHENSON, in formally introducing it, said Endocarditis in the pig had been known some time, and it was evidently identical with a disease among pigs that had been noticed in America.

Dr. G. MURRAY then gave a very clear demonstration of the specimens furnished him, and in the course of his remarks said some of the vegetations were as large as walnuts, and that personally he had not hitherto seen any so large. He then referred to his methods of preparing and mounting the specimens, and stated that Mr. Arup had furnished him with specimens prepared by Dr. Bang, of Copenhagen, and although he did not wish to put too much reliance on the influence of bacteria as productive of disease until the influence had been proved by inoculation, yet, as far as he could see at present, the specimens he had prepared for Mr. Stephenson were identical in their character with those he had been furnished with (Dr. Bang's) by Mr. Ayrup.

Professor MCCALL said that unfortunately he had been unable to pay very close attention to the reports in the journals of the specimens described by Mr. Stephenson and Dr. Murray. In the course of his experience he had examined many hearts, but had not witnessed the vegetations, but he felt certain these growths had no relation to Swine Fever as known in this country, and it was his intention to pay greater attention to this question in his *post-mortem* examination of swine.

Mr. ARUP said—Mr. PRESIDENT AND GENTLEMEN: In the most interesting paper on Endocarditis in the Pig, read by our highly esteemed colleague, Mr. Stephenson, at your last meeting, you will find the question, "Were these pigs suffering from some unrecognised form of Swine Fever?" From Denmark I know a little about the matter, and I shall try to give you the little I know. But to make sure this was really the same disease that I have seen here, I have induced my esteemed friend, Dr. Bang, Professor at the Royal Veterinary and Agricultural High School in Denmark, to send two microscopical preparations, which I have handed to Dr. Murray, from whom you already have been informed that he considers them to be quite in conformity to the specimens belonging to the illness in question. But now a contra question. What is Swine Fever? If it is only the infectious disease whose most prevalent symptoms are the work of destruction from Diphtheria in the large intestines (cæcum and colon), then Endocarditis has nothing to do with Swine Fever. But there is another infectious disease in pigs—Erysipelas, Anthrakitis, the Germans' Rothlauf—allow me to translate it Red Disease—which has unfortunately been well known in Denmark for more than twenty years, and the chronic form of which seems to be the Endocarditis. The principal symptoms of the Red Disease are weakness, fever, constipation, discolouration of the skin; and *post-mortem*, black and thick blood, hyperæmia in the spleen and liver; if extending over several days, you will find the glands, especially the Peyers patches, swollen, and then it may be wrongly termed Swine Fever. In Denmark it was first looked upon as Anthrax, hence the erroneous name. After the discovery of the bacilli of Anthrax this idea was naturally changed, and it was considered a Typhus, but now, only a few years ago, after further examinations, especially by Dr. Loeffler and Prof. Schutz in Berlin, it has been recognised as a special infectious disease with its own bacillus, which may be seen on this design, where you will also find the bacillus of Anthrax, and thus see the difference

between these two, the former being by far the smaller. The bacilli have been cultivated and injected in mice, when a well-marked special disease has been produced which has been transferred back to swine again, and the disease may now be classed among the best known diseases in the pig.

Since the year 1882 several diseased hearts from swine described as Endocarditis Verrucosa, have been handed to the Veterinary Pathological Cabinet in Copenhagen. The Red Disease up to then was only known in the province of Jutland, but in autumn, 1887, we had the first outbreak of a new infectious swine disease in Copenhagen and Zeeland, and this proved to be what you call Swine Fever—Diphtheria. It was a heavy attack, but following the system or total slaughtering of sound and diseased animals in infected places, we succeeded in stamping it out, and since that we have had only a few outbreaks of a more chronic form, and less contagious, on the islands only. This outbreak resulted in a closer examination of the diseases in swine, the old and several new cases of Endocarditis were examined, and in a lecture given in the Jutland Veterinary Society, Dr. Bang gave his experience about the disease, and proved the bacilli found in the heart-illness to be the same as in the Red Disease. Being cultivated in the usual manner, they showed the same shape in culture as the germs from Red Disease, and inoculated in mice, produced the same form of disease. In Switzerland the same result was observed. Hess and Guillebeau tried to inoculate swine with Red Disease as a preventive remedy, and in some cases no outbreaks took place, but a few weeks later they found a full-developed growth in the Endocardium in those inoculated pigs, especially in the young ones, and a few also had an attack in the hip joint. Here, too, it was stated that the two diseases were of the same origin; and further, that the Endocarditis proved to be a chronic form, and less contagious than the Red Disease. Now, you understand why I took so great an interest in the specimen shown to you. When I arrived here I was astonished to learn that you had no Red Disease, and I doubted very much whether it could be so. In the years 1881-82 we had swine from Denmark slaughtered here in England as suffering from Swine Fever, and our swine in the future had to be landed for slaughtering only. But at that date, as I told you, we had not seen the Swine Fever in Denmark, and the only explanation seemed to be that the two diseases were identified in England. This suspicion was confirmed when I found in your Veterinary Report of 1888, p. 14, "Valvular diseases in heart extremely common in swine, and other non-infectious complaints are attended with symptoms which may be mistaken for Swine Fever;" and p. 177, "A suspicion naturally arises that more than one affection is classed under the head of Swine Fever, and that in those districts where so many recoveries take place the outbreaks reported are not all genuine, but cases of less fatal diseases are accepted as Swine Fever." And you will find similar expressions in the last report. Here I suggested the Red Disease, and now, after having seen this Endocarditis, I am quite sure that you will find the acute form of Red Disease also. It is not considered so dangerous as the Swine Fever, though we in Denmark have added measures against it to our Infectious Diseases Animals Act of 1857.

Only a few words more. The Germans speak of a third contagious disease in swine where the principal symptoms are: Pleuro-pneumonia with Pericarditis, and in which has been found an ovate bacterium very similar to that found in fowl-cholera; it is simply described as "Schweineseuche"—swine disease. But I never saw it, and it was never found in Denmark. As to Swine Fever, the germs belonging to it are not more closely defined. Something has been said about two different bacilli appearing at the same time. In a recent tissue, however, Dr. Bang, who has paid a great deal of attention to these matters since the outbreak of Swine Fever in Denmark, stated that in

any case of local necrosis, mortification, or diphtheria, the thinner one of the two is always to be found; so, too, in diphtheria in calves, ulcerations in the feet of cattle, gangrenous grease in the horse, etc., and he succeeded in producing Diphtheria in calves by a culture originally taken from the fetlock of a horse. He has termed the germs of bacilli of necrosis, and as you will see there is still a wide field for discoveries in swine diseases.

Mr. BOWHILL claimed that he discovered the germ of Swine Fever, and that after cultivation he had proved it to be identical with that he had seen while with Dr. Billings in America.

Professor WILLIAMS thought the growths were of Rheumatic origin, owing, perhaps, to the exposure that pigs were subject to. He had seen similar growths in cattle and horses, and he did not think it had anything in common with Swine Fever, but appeared to him, if anything, more related to Anthrax; the blood in the vessels becoming of a black colour, whereas in Swine Fever no such tendency on the part of the blood to change its character exists. He unhesitatingly affirmed there was no basis for coming to the conclusion it was Swine Fever.

The PRESIDENT pointed out that, from what Mr. Stephenson told him, there was no evidence of contagion.

Mr. MOORE then proposed, and Mr. D. Dudgeon seconded, a hearty vote of thanks to Mr. Stephenson and Dr. Murray for the pains they had taken in elucidating this disease in swine, and which had been the means of affording this meeting such an excellent discussion.—Carried with acclamation.

The following paper was read by Professor MCCALL:—

ARE BLISTERS HURTFUL OR BENEFICIAL IN ACUTE DISEASES OF THE CHEST?

GENTLEMEN,—When I received the information through your Secretary that it was the desire of the members of this Society that I should open to-day's meeting by the introduction of a subject for discussion, I naturally set my mind to seek out one which would be of interest to all, and on which all might express an opinion, Observing in the pages of the *North British Agriculturist*, as I dare say many of you also had, that a discussion had arisen on the subject of "Counter-irritation in Chest Affections," and that that discussion had, to say the least, been abruptly terminated, I thought it would not be out of place to make it the theme of my remarks to-day. It cannot be said that the subject of counter-irritation in chest diseases is one of no special interest to the physician and his patient, or that it is immaterial whether veterinarians avail themselves of such aids in the treatment of chest diseases, or abstain from their application. That counter-irritants have a positive action and influence on the subject to which they are applied, and that for good or bad, is unquestionable; and now that there are members in our ranks (whether few or many I cannot say) openly declaring that they are destructive instead of helpful aids in the treatment of almost, if not all, chest affections, we as a profession cannot remain neutral observers. Nay, I hold that by the publicity which has been given to the discussion, the time has now come when, in order to right ourselves in the eyes of the public (if for no higher reason) it is imperative that each member of the profession should give expression to the results of his experience, and the conscious belief he entertains as to the value or otherwise of counter-irritation in chest diseases. If bad they do, they must be discontinued, and honour bestowed on the member of our profession who has most openly declared against them, namely Professor Williams; but, on the other hand, even supposing those who advocate their use be charged (and not unjustly by their opponents) as not at one as to the *modus operandi* or manner in which they act for good, yet, if convinced that good results, they must defend their position at all hazards. With these I consider necessary observations to the introduction of the subject, I shall now pointedly refer to

some of the remarks Professor Williams has made in his work on "The Principles and Practice of Veterinary Medicine." He says, "Irritation of the sides and breast is injurious in *all* instances of chest diseases in the horse, excepting those cases in the second stage of Pleurisy, and where the horse neither gets better nor worse for several days—'hangs fire,' as it is commonly termed." Again, "The application of blisters causes pain, increases the fever, and cannot and does not remove the internal inflammation. If applied to the side, they impede the respiratory movements by the pain they cause, and thus add to the distress and suffering of the animal." Now these are serious charges, and if they could be substantiated they might justify the abolition of counter-irritants in chest diseases; but when I carefully peruse the work from which I have made these extracts, in the hope of finding valid reasons for the condemnation thus passed, I fail in discovering even a vestige of proof. Professor Williams twits the advocates of counter-irritation with differing in their views as to how counter-irritants act, and at what stage of the inflammation they should be applied; and yet without experimental evidence or proof of any kind he hesitates not to state that counter-irritation is injurious, with one exception, "in *all* chest affections." He also writes: "I stand almost alone in my condemnation of the prevailing method of treating such diseases, and at the present time this Institution is the only college in Great Britain in which counter-irritation in chest affection is condemned." Might I ask, is this written in pain and disappointment, or in pride and, I had almost said, arrogance? I hope the former; but if so, has he not himself to blame if he stands almost alone in the condemnation of counter-irritants? Students, out of respect and love for their teacher, may follow his lead, but the time comes when even they will refuse to believe in that which they cannot understand; and as Professor Williams has yet to explain and prove how counter-irritation acts prejudicially in chest diseases, need he wonder that probably ninety per cent., or even more, of his professional brethren still remain the advocates of counter-irritation and unconverted by what he has said? Judging by what has been written by those who decry counter-irritation, it is fraught with danger to offer any remarks by way of explanation as to the manner in which counter-irritants act; and unless the advocates of counter-irritation can reconcile the various views expressed or entertained, the opponents of counter-irritation proclaim "This is another argument which tells against blisters." If so, is it not a very weak one? But what are the advocates of counter-irritation under given conditions to say of their opponents who condemn counter-irritants and offer no explanation or proof? It is clear, however, that no progress will be made in deciding whether blisters are beneficial or hurtful in the treatment of chest diseases until their advocates and opponents cease to dogmatise, and resort to mutual explanations and proof. As it is, Professor Williams, who has not only called in question the action and utility of counter-irritants, but who has also proclaimed that they are hurtful in chest affections; therefore it is he who should have led evidence and proved to us wherein we were in error; but as that would entail the adjournment of our meeting, I am quite prepared to give him the advantage of what I have briefly to say in support of counter-irritation.

Firstly. How then does the counter-irritant mustard act on the chest, and produce a beneficial result in congestions and inflammations of lung-tissue? To answer this question I must refer to the anatomical structure of the blood-vessels.

The nervous apparatus for the control of the calibre or size and movements of the minute arteries of the body is at once wonderfully simple and infinitely complex. We may call it the "vaso-motor" mechanism. And first and foremost it must be distinctly understood that this vaso-motor mechanism consists of two separate and independent parts, each controlling its own dis-

tricts in its own way. The first part goes by the rather misleading name of "vaso-constrictor" mechanism, which, to say the least, is rather awkward, for it may at one time bring about constriction of the blood vessels, and at another time dilation of the same.

Its head office, or chief "centre" is located in the "medulla oblongata"; and there are also, but less important, "centres" in the spinal cord. From these centres "efferent" or outgoing nerve fibres run through the so-called "sympathetic system" to the vast arterial districts of the skin and alimentary canal. During the greater part of time these fibres are engaged or employed in carrying *out* from the "centres" impulses just strong enough to keep the walls of the small arteries (which are formed essentially of circular muscular fibres) of each district in a state of moderate constriction, which we call "tone." But from time to time, as occasion arises, the "centres" are induced either to send out extra strong impulses, bringing about extra constriction and consequent anæmia and pallor of the surface, or to lessen or stop the issue of the usual and normal impulses, and in this way bring about dilatation of the walls of the vessels, and consequent redness or blushing of the surface.

The "centres" are induced to make these changes in their usual behaviour, either by messages from the *brain* (one "emotion," for example, causes pallor or a death-like whiteness of the face, while another "emotion" calls up a crimson blush), or from almost *any part of the body, including the skin itself.*

In the latter case, for example, when we put a blister to the skin, there is a message to the "centres," an occurrence in the centres, and perhaps a partial or total stop in the issue of the usual impulses to the small arteries of the portion of skin. There is triple occurrence called the "reflex" action. The skin blushes. This first part of the "vaso-motor" mechanism—this so-called "vaso-constrictor" mechanism—is in the main the instrument to be played upon in the practice of counter-irritation. The other part, the "vaso-dilator" mechanism, we need not consider at length, as it is more immediately concerned in regulating the dilatation of vessels in glands during the periods of active secretion.

Much more might be stated—indeed, less could not be said; but what has been stated rests on a proven basis. But to proceed. We have now submitted to our care two horses, labouring under an attack of pneumonia, in the stage of congestion and exudation; and we will suppose that the one animal is younger and more robust than the other, or the attack is more aggravated and involves a larger surface, or the lung-tissue is not so healthy in the second as in the first horse. To start with, we know we have two very different patients to deal with, although labouring under the same malady; and our internal remedies must be different. To the chest of both, however, a mustard cataplasm is applied; in each, one pound of mustard, well rubbed in, paper above, body-sweller over all, fitting exactly, being laced on, but not applied tight. In half-an-hour the more robust animal is showing considerable uneasiness, and even lying down and getting up; and he repeats this several times. Two hours have passed over, the perspiration has ceased, the pain, the result of the irritant, has disappeared, the pulse and respirations are quicker, the temperature one degree up, and the sides are tender to touch, in from six to twelve hours, the temperature, pulse, and respiration are as low as they were before the application of the mustard, the sides of the chest are swollen from effusion; and from this time onwards we have a gradual improvement and an ultimate recovery. In our weaker subject the symptoms exhibited on the application of the mustard are much the same as in the first, namely, increase of pulse, temperature, and breathing; but in some subjects, such as this one, the pain consequent on the application of the mustard is very slight indeed; but whether or not, one thing is observable,

namely, the surfaces to which the mustard has been applied are not in the least tender to touch or swollen from effusion—in other words, the mustard has failed in exciting an inflammation of the skin. We, however (not that it is our practice), reapply the mustard, and still the result is no greater a success; and we shall also suppose that this subject does not recover, but eventually dies. Now, why have we in the case of the one animal a marked local inflammation with its attendant results, and in the other no local inflammation worthy of the name? As results of the application of mustard to the skin in health, and in no less than ninety per cent. of chest affections, we have determination and congestion of blood in the blood vessels of the skin to the extent of the surface of skin subjected to the action of the irritant, and as an after effect, effusion into the cellular tissue under the skin. Now this determination of blood is primarily brought about by the action of the mustard on the sensory nerves of the skin, and through the "vaso-motor centre" in the medulla, on the vaso-constrictor and vaso-dilator nerves, regulating the contractions and dilations of the blood-vessels of the skin.

In our first animal, the telegraphic message, flashed by the sensory nerves of the skin to the head office (the vaso-motor centre in the medulla), is instantly responded to, and an influx of blood and a copious effusion is the response. That influx of blood brings with it pain, increase of temperature and breathing; but it is only temporary, and subsides in a short time, to be replaced by freedom in breathing, slowing of the heart's movements, decline of temperature, gradual subsidence of the congestion and inflammation of lung-tissue, and a return to normal cell action and nutritive activity.

Apparently, the conditions which lead to dilatation and accumulation of blood in the vessels of the skin covering the chest wall, tend to promote a return of contractibility in the dilated and engorged blood-vessels of the the lungs, and the mechanism of reflex action, and the direct experiments of Zulzer and others, all point in this direction. Zulzer found that when "cantharides collodion" was painted repeatedly over the back of a rabbit on one side for a number of days, the vessels underneath the skin and the superficial layers of muscles were congested, and the deeper layers of the muscles, the thoracic wall, and even the lung itself, were much paler and more anæmic than those of the other side.

In our other patient the counter-irritant has failed in influencing the vaso-motor centre. And why? Because the internal inflammation proceeding in the lung is of a more pronounced, a more destructive, more overpowering character than in the former case; or, in other words, the paralysed and dilated condition of the walls of the blood-vessels, the accumulation of blood and effusion of lymph has so seriously disturbed or concentrated nerve influence at the fountain-head—"vaso-motor centre"—that it has not the power to respond to the local call addressed to it. In other words, the vaso-motor centre is so much occupied by afferent messages from the lung, and perhaps efferent messages to the lung, that it cannot attend to afferent messages from the skin. Surely this is not an unwarrantable explanation; nay, I think it is justified by all we know of the physiology of the nervous system, and of the influence of nerve power in controlling muscular movement, blood circulation, and brain energy; for where is the individual who can think and speak on two subjects, or act two distinct parts at the same instant of time? or where is the man who will not change colour under the mental influence of shame, or it may be terror? Professor Williams, as I have previously stated, says, "Counter-irritation is injurious in chest affections because it cannot and does not remove the internal inflammation, and in proof of this he instances a case of pleurisy, where repeated application of counter-irritants had been applied to the sides; and on *post-mortem* he found all the evidences of marked inflamma-

tion on the pleura and chest walls. Now, it entirely depends on what evidence he holds to be confirmatory of the removal of internal inflammation. If, for example, the confirmatory proof must amount to the eye failing to detect any abnormal condition or the presence of abnormal products, then he is quite right; but if counter-irritants on this account are to be discarded, will he mention what agent he can substitute which is not open to the same objection? He cannot, nor any other person; for inflammation once established produces changes that no remedy or combination of remedies can there and then obliterate or sponge out. But although we cannot remove the internal inflammation and its products *instantly*, are there no remedies that can be applied to influence and moderate its course? In ninety-five cases out of one hundred, counter-irritants will do this. If, then, they do not remove the internal inflammation, but by establishing a second and more manageable inflammation, check the further course of the primary inflammation (as I maintain they do), then they are justly entitled to be called beneficial, and not hurtful agents in the treatment of chest disease.

That *two inflammations* do not flourish together every unbiassed practitioner must have seen cause to admit. When the artificial inflammation, established by counter-irritation flourishes, as is evidenced by the heat, pain, and swelling of the chest-wall, the internal inflammation gradually subsides. On the other hand, when the counter-irritant has produced almost no greater effect than its *chemical* action would produce when applied to the chest of a dead horse, then the internal inflammation may be said to flourish and the external to be of little avail. In this way counter-irritation is not only of value in assisting in checking and moderating internal inflammations, but also in assisting us most materially in prognosticating a favourable or unfavourable termination of the disease. In the treatment of an acute inflammation the relief of pain is most important and that may be attained in two ways, namely, by the administration of narcotics and anodynes, and by *diverting nerve-energy* from the inflamed part into another channel, and the latter is incomparably better than the former, and of all agents, counter-irritants are the best to effect this end.

In proof of this, take the very common case of a simple pimple or a boil that has been aggravated by scratching the head off, as also the absorption of some morbific agent. A hard swelling with great heat and throbbing pain is the result. The patient is fevered, has no appetite, and, notwithstanding the application of poultices, laxative and narcotic medicine, there is no relief from pain or progress made towards a recovery; the "patient hangs fire," to use Professor Williams' own words. We now resort to counter-irritation. At a short distance from the boundary of the inflamed part, we apply, with a camel-hair pencil, tincture of iodine, solution of nitrate of silver, or other counter-irritant, in the form of a circle or horse-shoe, and what is the result? Within an hour or two the pain has almost ceased, and by a daily application of the counter-irritant for a few days the hard swelling is gradually removed by absorption. We take another case, a horse has an attack of Pharyngo-laryngitis. The irritability of the sensory nerves is very marked; he has a craving for food, but experiences great difficulty in swallowing; and either from attempting to swallow too quickly, resulting in spasm of the constrictor muscles of the larynx, or from rapid effusion or œdema of the glottis (for sometimes it is the one and sometimes the other), there ensues a most marked difficulty in breathing; and unless measures be taken to allow air to enter the chest the animal will die. There is one effectual remedy for this condition, namely, tracheotomy; but is there no other? Yes, there is, and one in many such instances quite as potent to relieve the distress in breathing, and that is counter-irritation. Plaster on and rub in two pounds of

mustard around the larynx, betwixt the jaws and down the trachea; and in the bulk of cases relief is experienced, as is demonstrated by the *immediate* cessation of the loud noise and the heaving of the flanks.

That counter-irritation here has not removed the primary inflammation must be patent to all, for there is not sufficient time to do so; but that it has by establishing a local seat of irritation and congestion, and by *concentrating nerve-energy upon it, allayed nerve-irritability* and consequent spasm of muscular fibre in connection with the larynx cannot be denied, and therefore I hold that local or external counter-irritation acts beneficially in the treatment of internal inflammation. Professor Williams also writes, "If you have an acutely inflamed surface and apply an irritant to the skin, opposite that surface, as is done in the treatment of Pleurisy, you will most assuredly *increase the inflammation.*" Now, is this statement founded on fact? Professor Williams admits he "cannot see any direct vascular connection between the chest-wall and the lungs," and yet he asserts that if we counter-irritate the chest we will "assuredly increase the original inflammation." Would the Professor not go the length of saying "If you would apply a pound of mustard to the chest-wall of a healthy horse you will, as a consequence, produce inflammation of the lungs?" If he will prove that to me, then I will lay down my pen and admit that counter-irritation is worse than useless, a barbarous remedy, and a disgrace to the medical and veterinary profession. But he cannot, and now we come to closer quarters. Can he tell *during life* the *extent* of inflammation existing in the pleuro or lungs, and the *exact stage* in which it is? No, he cannot. We now apply a mustard cataplasm to the chest-wall of this same horse, and we shall suppose he dies in twelve hours or twelve days thereafter, or any lesser or longer period. Can Professor Williams, now the book is opened by *post-mortem* examination; point out *the lesions* produced by the original or primary inflammations, and those added to them by counter-irritation of the skin? No, he cannot. Where, then, I ask, is the proof warranting the charge, the calumny that "if you have an acutely inflamed surface and apply an irritant to the skin opposite that surface, as is done in the treatment of Pleurisy, you will most assuredly increase the original inflammation?" But, says the Professor, "this can easily be proved by causing a superficial inflammation around a chronically diseased joint and dissecting the parts, say three days afterwards, when it will be found that the skin, subcutaneous tissue, and the bones, if sufficiently near the surface, such as those of the hock, pastern, etc., are all involved in the inflammatory action thus induced." Now, in the meantime, granting that what he has thus stated be more or less true as regards the series of changes produced in the various structures mentioned by the application of a cantharidine blister to a chronically diseased joint, does he not perceive that he is begging the question when he says that the same series of changes result when mustard is applied to the chest-wall in inflammation of the lungs, because he has drawn deductions from entirely different premises? The character and stage of inflammation, the anatomical structure and conformation, the relations of blood circulation and nerve distribution are all different; and moreover, the counter-irritant named (cantharides) is one seldom applied to the chest-wall in the treatment of a lung affection. If the lungs of a horse lay immediately underneath the skin of the chest, as the bones of the hock and pastern do, and if we were discussing the benefits of counter-irritation in chronic forms of inflammation of the lungs, then Professor Williams's inferences might be pertinent to the subject; but as they are, they only confuse instead of shedding light on the subject of counter-irritation in chest affections. But is it the fact that when a blister is applied to the skin covering a "chronically diseased joint," inflammation is thereby set up in the skin, cellular tissue, periosteum, and bones? Professor Williams not only says

so, but he further adds, "in this manner counter-irritants are beneficial in chronic inflammations."

Would Professor Williams not go the length of saying that counter-irritants applied to the skin covering a *healthy joint* set up an inflammation in the skin, cellular tissue, periosteum, and bones? If he says no, and that their action does not extend deeper than the subcutaneous tissue, then, I ask, why in one case and not in the other? Speaking for myself, I have seen on *post-mortem* the same changes produced by cantharidine blister on a healthy joint as on a "chronically diseased one," and I therefore go the length of saying that in neither case does the local inflammation extend to the bone. If it did it would aggravate the disease, and counter-irritation would do harm instead of good.

But, like Professor Williams, I have also put this matter to a practical test, and that within the last eight days, and I will now briefly detail the results:—

No. 1. *Post-mortem* examination of the chest of a horse, which, three days prior to slaughter, had mustard as a counter-irritant applied. Inflammatory congestion of skin and subcutaneous cell tissue, with effusion very pronounced; but periosteum, ribs, and other tissues unaltered in colour or consistency.

No. 2. *Post-mortem* examination of a chronically diseased hock joint, which has been "pyro-punctured" and thereafter blistered, about one week prior to slaughter. Inflammatory action pronounced in the skin, and markedly at the points of puncture with the "irons" on the superficial layer of subcutaneous tissue; but all structures deeper placed not in the least affected or altered in appearance.

No. 3. *Post-mortem* examination of "chronically" enlarged fore fetlock joints of a horse, which, three days prior to slaughter, had been blistered with cantharidine ointment. Inflammatory action and effusion confined to skin and subcutaneous cell tissue.

No. 4. *Post-mortem* examination of a "lady-toed" worn harness horse, having a large "splint" or bony growth on the inside of each fore-limb, with considerable thickening of the skin from "brushing," and to which diseased parts cantharidine blisters had been applied three days prior to slaughter. Inflammatory action marked on skin and cellular tissue, but no deeper.

No. 5. *Post-mortem* examination of a horse which had a considerable growth of bone, involving the last row of small bones of hock and head of large metatarsal bone on the outside, and which had been "line-fired" and thereafter blistered with cantharidine ointment three days prior to slaughter. Evidences of the effect of the "counter-irritation" well marked, but confined, as in all the previous cases, to the skin and subcutaneous cell tissue, and leaving the periosteum, bones, and deeper structures to the unaided eye unaffected and unchanged in colour.

When we blister or fire a "chronically-diseased joint," I again ask, do we set up acute inflammation in the periosteum, bones, and synovial membranes? If so, how is it that the periosteal and bony growths are, as a rule, not increased in size but reduced thereby, and the mobility not decreased but increased, and the pain not intensified but diminished? Bones expand under the influence of inflammation, and mobility is diminished and pain increased; but such are not the results of counter-irritation when judiciously applied to a "chronically-diseased joint."

No remedy allays pain like counter-irritation when the counter-irritant is not actually applied to the inflamed part, but to a part in its vicinity. Explain it as you may, but such is the fact.

Professor Williams admits the benefit to be derived by counter-irritation in chest affections that "hang fire," and in "chronic inflammations of joints." And his explanation, in the first instance, is "that the gentle stimulation of the skin often induces the beginning of convalescence, and acts as a stimulant

to the whole body;" and in the second, that the counter-irritant re-excites "acute inflammation in the skin, subcutaneous tissue, and the bones."

But to my mind there is but one method and one explanation, and that is, the allaying of the pain in the diseased part and the restoration of normal circulation and cell growth; but the first must precede the other two. And I maintain that counter-irritants never benefit by re-exciting inflammation in diseased parts (be that inflammation acute or chronic), but by exciting inflammation in the healthy tissue-elements of the skin to which *they are applied*, and thereby concentrating nerve-energy on the locally inflamed part, and by reflex action relieving the pain in the originally diseased part.

In his last contribution to the pages of *The North British Agriculturist*, Professor Williams admits that when he "applied counter-irritants in the treatment of Pleurisy or Pleuro-pneumonia, the condition of Hydrothorax ending fatally was not an uncommon one; but that now this Dropsy of the chest is almost unknown, although Pleurisy and Pleuro-pneumonia are as rife as ever." So that Professor Williams, in other words, charges counter-irritants with inducing a rapid transudation of the water of the blood into the chest; and in support of his contention refers in a delicate way to a "consultant" who ordered mustard to be applied to the sides of horses labouring under Influenza, and that 25 per cent. of these animals had Hydrothorax the next day, which in every case terminated fatally."

There are always two sides to a question, and I should like to hear what the "consultant" has to say; and until I hear what he has to say I shall offer no positive opinion upon this, to me, most extraordinary result. But I will say this, that I have treated in my day thousands of cases of Influenza, and have had probably not fewer than one hundred cases daily on my hands for a month at a time. A large percentage of these animals were subjected to counter-irritation of the chest by mustard; and the number of deaths due to Hydrothorax, pure and uncomplicated, might almost be counted on my fingers; and in not one single instance would I feel justified in saying the counter-irritant brought about that result.

But did Professor Williams examine these horses on the day the "consultant" did? And did he find that there was no liquid detectable in the chest of any one of them prior to the irritant being applied? Did he make a *post-mortem* examination of the bodies of all the animals? And is it the fact that the only chest lesion was Hydrothorax? If so, then I should feel greatly obliged by the Professor explaining how the blister produced such "deadly havoc" in so short a period of time, and in otherwise healthy lung-tissue.

Professor Williams seems to be thoroughly satisfied that the application of counter-irritants to the chest-wall induces Hydrothorax in a large percentage of cases, and that twenty-five per cent. of the "consultant's" patients were actually killed by the counter-irritant. He has also charged me "with carefully avoiding answering his proposal that this matter (counter-irritants) be put to the test." But in this he is mistaken, and I take this opportunity of saying that, if he be willing, so am I, to treat, say, fifty cases of chest disease by counter-irritation to the chest, and the administration of medicinal agents; and if one of these animals dies from Hydrothorax, pure and uncomplicated, and which had no existence at and prior to the application of the counter-irritant, I shall pay £50 to the funds of the Veterinary Benevolent Association, he contributing a like sum to the Institution if none of the fifty die from any such disease.

That counter-irritants in the remote past, by the severity with which they were applied, did much harm I freely admit. As an instance of this, I remember, when a lad, seeing a red-hot shovel applied to the abdomen of a horse labouring under inflammation of the bowels. And I admit that even yet some practitioners and clients consider that the counter-irritant has not had

a fair chance until its application has been so severe as to produce more or less sloughing of the tissues to which it has been applied, and, as a consequence, a permanent blemish. But I fail to perceive the good that can accrue in either case, and am certain that if a moderate amount of irritation will not excite inflammation in the tissue to which it is applied, repeated counter-irritants or powerful counter-irritants will not do so; on the contrary, they will destroy the life of the part and hasten the death of the animal. In practice I apply counter-irritants early in almost every case of chest disease and joint affections. In chest affections I seldom apply the counter-irritant twice, and never thrice, to the same animal. If the counter-irritant produces marked tenderness on palpitation, and effusion into the subcutaneous tissue I am pleased, and as a rule the animal makes a favourable recovery; on the other hand, if the counter-irritant produces no local action, I invariably have a protracted and imperfect recovery, and not unfrequently a death. But, from all I can learn, the deaths in patients entrusted to my care are not more numerous than falls to the lot of Professor Williams; and as neither my conscience nor my clients have as yet upbraided me for using counter-irritation in the treatment of disease, I intend to defend and continue the practice.

DISCUSSION.

Professor WILLIAMS, on rising to reply, was very warmly received. He said the controversy had, so far, been conducted on the most friendly footing; but in the paper just read the Professor had been rather hard upon him, and he took that to indicate that Professor McCall was now feeling his position rather acutely. Professor McCall spoke about his conscience not accusing him of killing any horses by the use of counter-irritants, but they must observe that Professor McCall prescribes the mildest possible form of counter-irritation. In his first letter to the *North British Agriculturist*, Professor McCall entirely agreed that the application of cantharides in chest diseases was very bad practice, and led to very bad results. But in this connection they had to notice that many veterinary surgeons never applied mustard, because it caused great pain and excitement, followed by depression. They, therefore, held that mustard did more harm than good, and they applied cantharides instead, as being milder. When a horse's breathing was rapid, the application of mustard increased the rapidity of his breathing. Take a horse breathing at the rate of 100 times per minute, and apply mustard to the sides of that horse, and you would increase the rapidity of his respiration till he was no longer able to breathe at all. Blisters undoubtedly caused pain and fever, and an ordinary blister of, say 3 ounces of cantharides, applied to the sides of a horse, would, in twelve to fourteen hours, increase the temperature by 3 degs., and the pulse by 20 beats per minute. He had a record many years ago of a horse that was examined carefully, and his pulse stood at 50, while his temperature stood at a 100 degs. A blister of 3 ounces of cantharides was applied to his side, and the following morning his temperature stood at 103, he would eat nothing, and his pulsation was 70 per minute, and his respiration was exceedingly rapid. That blister had an effect which it would have done good to the eyes of Professor McCall to see. The animal was killed after the blister had been on for twenty hours, and what was the result? There was found an inch and a quarter of a yellow exudate in the subcutaneous tissue; and about three quarters of an inch between the pectoral muscles and ribs, the intercostal muscles were inflamed, and the pleural vessels were congested. Take, then, the case of a horse affected with Pleurisy, and his temperature standing at 106 degs., and treat him with the same amount of blister. By next morning that horse's temperature would be 109 degs., and a horse would not live long with temperature of 109 degs. Therefore, he said, it was running a great risk to do anything to elevate the temperature where such elevation of the

temperature was calculated to endanger the animal's life. Professor McCall spoke about reflex action causing constriction of the originally inflamed vessels whilst dilating those of the skin; but if you irritate and paralyse the vessels of the skin, you also paralyse the vessels of the chest, and while you are increasing the calibre of the superficial vessels that reflex action does not cause, as stated by Professor McCall, the converse condition within the chest. This reflex action, as stated by Hughes Bennett in his "Principles and Practice of Medicine" is still one of the most vexed questions in therapeutics. If you blister one part, not only is the skin and subcutaneous tissue inflamed, but the deeper seated tissues inflamed also, as was evident from the case he had mentioned, where they had the exudate within the muscles and intra-muscular spaces. Professor McCall accused him of being dogmatic. Well, perhaps he was very dogmatic, because he worked out the facts which brought him to a certain conclusion, and he stuck tenaciously to that conclusion, because he firmiy believed it to be a correct one. He had lived long enough to see all sorts of treatment applied for chest diseases. In his earlier days he was in Oldham, and there a blister to the breast and a rowel in the breast were regularly prescribed, and the success of that system was great comparatively. In Manchester at that time counter-irritation to the sides was very freely applied, and the success was not to be compared to that resulting from the Oldham practice. When he went to practice in Bradford he was as strong in favour of counter-irritation as he could be, and he lost as many patients as other veterinary surgeons. He had the advantage of hearing Professor Bennett on this subject, who said, thirty years ago, that this was a vexed question in medical science, and it remained a vexed question to this day. Well, he decided to change his tactics, and he did so with the greatest possible advantage to himself. In fact, it was the making of his practice in Bradford, for he succeeded to a ruined practice, and had he not been successful, he would never have built up the practice which he enjoyed. In one single year his practice went up by several hundred pounds, and that was entirely due to his success in the treatment of lung diseases. The challenge to treat 100 cases without counter-irritants, as against the treatment of 100 similar cases with blisters, was not made by him, but was made by the writer in the *North British Agriculturist*, and Professor McCall accepted it. But Professor McCall put the challenge beyond the range of acceptance, for he said that if any of those treated with counter-irritants died of pure Hydrothorax, he would give in to the opposite treatment. There was one great thing they must not forget in connection with this application of mustard to the side. Where there was a great deal of exudation there was a proportionately great amount of swelling, and that was the condition seemingly wanted in such a case. They must remember that there was such a thing as a lymphatic stream associated with the body and with the pleural surfaces. These lymphatic vessels radiating from the inflamed surface became surcharged with lymph; in fact, the little runlets were in flood on the sides of the chest when the pleura was inflamed, and if to this surcharged lymphatic stream you bring an exudation by artificial inflammation, you cause the outpouring of an immense quantity of lymph on the side. In other words, you mechanically block up the lymphatic vessels, and as the lymph was still poured out on the inflamed structure it must go into the cavity of the chest. Professor McCall threw some doubt on his statement, about 25 per cent. of some horses treated with counter-irritants having gone down with Hydrothorax. He knew it for a fact, however, and he could give the names if need be. The fact which he was prepared to prove at any time was explained by his reasoning about the blocking of the lymphatic stream. With regard to his contention that an inflammation when once set up cannot be removed by the excitation of another one, Professor McCall said, look at the acknowledged benefit of blisters in chronic cases. Well, when the inflamma-

tion has arrived at a chronic stage, that inflammation certainly was influenced by re-exciting the acute process, but that was precisely what he had all along taught. Professor McCall had said that he (the speaker) stood almost alone in the profession in standing out against the use of blisters in acute diseases of the chest. Well, he felt very proud at having the courage to stand up almost single handed for what he regarded as a cardinal truth. By not using these blisters he saved the horses all the intense suffering caused by those counter-irritants, and his patients were at work sooner than those treated with these excruciating and weakening blisters.

Mr. HUNTING, senior, of South Hetton Colliery, said he hoped that Professor Williams and Professor McCall would not go the length of pitting themselves against each other as to the greatest number of cures in a certain number of cases, because the conditions under which the patients were kept might be altogether different. In fact, the gulf between those eminent authorities was not so great as at first appeared. Professor McCall did not approve of the heroic practice of putting say, three ounces of liquid cantharides, and half an ounce of biniodide of mercury on a horse's chest. He (Mr. Hunting) had a good deal of experience of horses, as he had never less than seven or eight thousand horses under his charge, and he agreed with Professor McCall that a mild application of mustard to the side or along the course of the trachea decidedly did, in many cases, a deal of good. If you could, by stimulating the chest by a mild application of mustard, bring about some of the conditions of the healthy tissues, and as Professor Williams had said, throw the lymphatic vessels into the flood instead of the ordinary action, it was not at all unlikely that you would get a great advantage to the congested tissue, and however insignificant the benefit might be, the man grossly neglected his duty who did not apply such a remedy. He held that congestion was the first stage of inflammation, and that that was the important point where counter-irritation was exceedingly valuable. On the other hand, everybody who has treated cases of Influenza, or Pink-eye, as it is now called, knows that the man who relies upon counter-irritants mainly for the cure of lung congestion or Pleuro-pneumonia, knows nothing of what the animal wants. What the animal essentially wants in such a case is good nursing, especially good dietetic and hygienic conditions to facilitate recovery. The animal must have pure air, warm clothing, and good nourishing food and pure water. The man who didn't blister, but attended most carefully to the essentials of recovery, might be much more successful than the man who made a judicious use of blisters, but failed to attend to the essentials of success, and that fact might, to a very considerable extent, account for the marked success of Professor Williams in his treatment of this disease.

Professor MCCALL said that, whenever a case of Influenza came into his hands, his first care was to see that the animal was placed under the best dietetic and hygienic conditions, as he knew quite well that these in reality constituted, as Mr. Hunting had said, the essentials of success in the treatment of the disease. But, at the same time, he decidedly said that the use of counter-irritants had proved a very great help in dealing with the disease. He would not allow this discussion to drop until some benefit had been derived from it, and until they came to a clear and correct understanding upon it. Something had been said about taking the discussion out of the pages of the *N. B. Agriculturist*, where it had originated, and transferring it to the *Veterinarian;* but he would be only too glad to have the question thrashed out in the *N. B. Agriculturist*, and only wished the correspondence in that paper reproduced in the journals of the veterinary profession for the benefit of the great body of veterinary practitioners throughout the country.

The CHAIRMAN (Mr. Hunter) said that, as it was getting late, the discussion would have to be adjourned till their next meeting. They were under a deep

debt of obligation to Professor McCall and Professor Williams for coming there to give them the result of their large practice and wide experience on the subject. They could hardly expect these eminent teachers to come such a long way to their adjourned meeting; but if they did, the members of the North of England Society would give them a very hearty welcome.

Army Veterinary Department.

Gazette, March 17th.

Lancashire Hussars (Yeomanry).—W. G. Dixon, gentleman, to be Acting Veterinary Surgeon.

Obituary.

It is with much regret that we announce the death at Umballa, India, from liver-abscess, of J. H. Cox, First Class Veterinary Surgeon, Army Veterinary Department, at the early age of forty-four years. Mr. Cox graduated in 1867, and entered the Army in 1872, obtaining promotion to First Class in 1883. Much of his service was in India. He saw no active service, however, but was with the Bechuanaland Expedition in 1884-5. He was in every respect an excellent officer—active, intelligent, and enthusiastic; and there was every promise of a very successful career before him. It will be remembered that he opened the business of the first Veterinary Congress held in this country, by a paper on Tuberculosis. His death is a marked loss to the Army Veterinary Department, occurring so soon as it does after that of Mr. J. H. Steel.

Mr. W. Clark, M.R.C.V.S., a graduate of 1849, died at Islington on March 17th, aged 62 years.

Notes and News.

Age and Productiveness of Stallions.—A writer in the *Live Stock Journal* says:—The appearance in one of the illustrated papers of the skeleton of the famous Blankney sire, Hermit, has set people talking about the length of days to which stallions have lived and been productive. Hermit had but just completed his twenty-sixth year: and he was not, therefore, by any means the sire whose usefulness had been prolonged to the extremest limit. Mr. Joseph Osborne has published of Sir Hercules "that he was in his twenty-eighth year when he begat Lifeboat, and was thirty-one when Sir John Shelly bred Sir Hercules from him." Mr. Osborne gives these particulars of the famous old horse, Sir Hercules, which would seem to make him to have approached very near to a rare colour in light horses—*i.e.*, a dark iron-grey:—"He was a coal-black horse with a small star on his forehead and had a good-sized bunch of grey hairs at the butt of his tail; whilst his body, especially his flanks, was likewise thickly ticked with grey hairs." Sir Hercules was bred in Ireland, and his height was barely 15.2; and he is described as having been a "round-made horse." He died at the Wilton Stud (having been purchased in his old age by the Hon. Sidney Herbert) in 1855. It is somewhat noteworthy that the longest-lived thoroughbred mentioned in Mr. Osborne's volume is Janus, who died in Virginia, U.S.A., at the age of thirty-four, whilst Diomed also reached the age of thirty-one under similar conditions of transportation to America.

The Dishorning of Cattle.—At Edinburgh, on March 13th, it was decided by five judges on an appeal that the operation of dishorning cattle was necessary in the interests of the animals themselves, and that therefore the perpetrator could not be found guilty of cruelty. The judgment of the

Scottish court on this point is contrary to that pronounced by the English judges.

FARMHOUSES IN EARLY ENGLAND.—Before Elizabeth's time, farmhouses and cottages were very inferior, after that period they began to improve. Chimneys were not used in the farmhouses of Cheshire till within forty years of the publication of King's Vale-Royal (1656); the fire was in the midst of the house against a hob of clay, and the oxen lived under the same roof. —Whitaker, "Hist. of Craven," p. 334.

INFLUENZA IN NEW SOUTH WALES.—According to the *Mark Lane Express*, Mr. John Stewart, veterinary surgeon, informed a contemporary in Sydney, that the disease known as Pink Eye in horses has visited New South Wales in an epizootic form. It is spreading rapidly amongst the horses here, though more particularly among draught horses. Although rather serious, it is at present curable, if taken in its early stages, but if neglected or ignorantly treated, it takes but a short time to kill the patient.

MILKING SOWS.—If one has any doubt about the manner in which the milk of a cow or other nursing animal is secreted, and as to the sudden production of it through excitement of the lacteal glands, rather than to a continuous dribbling of it into the reservoirs of the udder, the doubt may be dispelled by observing a litter of young pigs taking their food from the maternal teats. At first there is no milk; the teats are dry; but soon, under the gentle rubbing of the udders, the process of lactation begins; the sow enjoys the sensation, and evinces the pleasing excitement by occasional grunts; when, in time, the grunting becomes continuous, the milk then flows copiously until the little pigs are satisfied, and the ability of the glands to secrete milk is exhausted. Clearly there is no gradual collection of milk reservoirs, for there are none of these in a sow's udder, not so much as in the sometimes enlarged ducts of the cow's udder. The gland is of a solid granular consistence, with scarcely a duct to be perceived, although they may be seen on dissection and when magnified; and the udder does not enlarge, and the milk does not flow for some minutes after the pigs begin to suck. And to know how the milk is formed in the udder is the foundation upon which rules for milking are to be based.

ETIOLOGY OF GROUSE DISEASE.—Prof. E. KLEIN (*Centralbl. f. Bakteriologie u. Parasitenk*, No 2. Band ix, January, 1891) adds some notes to his observations already published on the etiology of grouse disease. He finds that the bacillus of the grouse disease as it occurs in autumn is not nearly so virulent as that obtained from the disease during the spring months, the bacilli being obtained from the heart blood in the autumn and from the lungs in the spring. Only two out of ten mice that were inoculated died; all the eight that remained alive were refractory to the action of the spring grouse bacillus. The control mice inoculated with the same spring culture all died in from twenty to forty hours. The one attack of the milder autumn disease rendered the animals immune to the more virulent spring disease.

Correspondence.

THE LATE J. H. STEEL.

DEAR SIR,—Your very feeling expressions of condolence with myself, wife, and family in our great loss, when, noticing in your issue for January, the death of my dear son, gives me an opportunity of publishing, with your permission, our sincere gratitude for the marked manner in which the profession generally has abundantly testified its respect for the memory of one whose energy and talents justly rendered us proud. Will you grant me the favour

of inserting in your next, our deep appreciation of your personal sympathy and that of our numerous friends, whose general, and in many instances affectionate, regrets cannot possibly be individually responded to?

188, Clonliffe Road, Dublin. CHAS. STEEL.

NATIONAL VETERINARY ASSOCIATION.

DEAR SIR,—Would you be good enough to notify through your journal that the annual meeting of the National Veterinary Association will be held at Doncaster during July, and that any member wishing the opinion of the meeting upon any subject must give notice to the prov. sec. They will take precedence in the order received.—I am, dear sir, faithfully yours,

JOSEPH ABSON, *Prov. Sec.*

AN AMENDE HONORABLE.

SIR,—In the Journal for this month, you invite an explanation from the writer of the letter in the February number, to which I have the pleasure to accede. I take it as an item in the Code of honour of gentlemen, that, having made a mistake, an honourable man should frankly acknowledge and apologise for the unintentional error. By the accidental omission of a word in my letter in the Journal for February, the opposite was expressed to what I intended. Mr. Hunting did not decline to propose the health of the Queen; and I much regret that my letter unintentionally represented that he did decline to take part in this customary act of loyalty to the Sovereign. I trust, therefore, that I may be allowed to withdraw it. ANTI-ANARCHIST.

[We have much pleasure in giving space to this *amende honorable* of our correspondent, in whose expression of regret we cordially concur.—ED. *V.J.*]

Communications, Books, Journals, etc., Received.

COMMUNICATIONS have been received from C. Steel, Dublin; J. A. Nunn, A.V.D.; R. W. Burke, A.V.D.; S. Villar, Harrow; T. Greaves, Manchester; W. S. Adam, A.V.D., Hosur, India; E. Millais, London; W. Woods, Wigan; T. B. Goodall, Christchurch; Professor Smith, Ontario; J. Dowling Allman, London; J. Abson, Sheffield; S. Sisson, Toronto; A. W. Hill, London; J. Malcolm, Birmingham; H. J. Dawes, West Bromwich; W. A. Hancock, Newcastle-on-Tyne; H. Kidd, Hungerford; H. T. Pease, A.V.D., Lahore; "Anti-Anarchist;" W. Hodgson, Brigham, Cumberland; E. F. de Jong, Edinburgh.

BOOKS AND PAMPHLETS: *E. Millais*, The Theory and Practice of Rational Breeding; *Captains Lupinacci and Baruchello*, Vade Mecum di Veterinaria Militari; *M. V. Galtier*, Traité de Maladies Contagieuses, et de la Police Sanitaire des Animaux Domestiques; *M. E. Aureggio*, Les Chevaux de Guerre; Encyklopadie der Gesammten Thierheilkunde und Thierzucht; Bulletin des Seances de la Société Nationale d'Agriculture de France; Proceedings of the Royal Geographical Society; Journal of the Society of Arts.

JOURNALS, ETC.: *Echo Veterinaire; Thierarzt; Mark Lane Express; Repertorium der Thierheilkunde; Bulletin of Pharmacy; American Lancet; Therapeutic Gazette; Medical Age Recueil de Méd. Veterinaire; Revue Veterinaire; Lancet; Live Stock Journal; Annales de Med. Veterinaire; Edinburgh Medical Journal; British Medical Journal; Clinica Veterinaria; Moderno Zooiatro; American Veterinary Review; Journal of the Society of Arts; Revue Internationale de Medecine Dosimetrique Veterinaire; Hospital Gazette; Practitioner; Journal of the Royal Agricultural Society; Journal de Med. Veterinaire et de Zootechnie.*

NEWSPAPERS: *Scottish Leader; Wigan Observer; Edinburgh Evening Dispatch.*